Chapter 3: Affected Environment and Environmental Consequences

This section describes the environmental context and environmental consequences of the No Build and Build Alternatives, as well as measures considered to avoid, minimize, and mitigate impacts associated with the Preferred Alternative. References to the Build Alternative generally refer to both the 110-foot typical section and 94-foot ROW Option (**Figure 2-3**). When applicable, the difference for the 94-foot ROW Option (between 800 West and 700 West) is presented separately. As discussed in **Section 2.4.5**, the Preferred Alternative is the 110-foot typical section with the 94-foot ROW Option. While all resources were considered during project scoping, this EA provides more detailed discussions of resource topics and impacts when relevant to the decision-making process.

3.1 LAND USE

The project is located within Davis County. The majority of the project is located within the incorporated limits of the cities of Woods Cross and West Bountiful (**Figure 3-1**). A small section west of Redwood Road, between 1500 South and 500 South, is located within unincorporated Davis County. At 2600 South, the project ties into a previously widened section of Redwood Road in North Salt Lake. Although land use and the community impact assessments focus on Woods Cross and West Bountiful, additional information for Davis County and North Salt Lake is provided for regional context.

3.1.1 Existing Land Use and Zoning

Zoning adjacent to the project corridor in West Bountiful, Woods Cross, and North Salt Lake is illustrated in **Figure 3-1**. Both Woods Cross and West Bountiful are characterized as bedroom communities with land uses developed at a suburban density. Existing land uses along the project corridor include residential, retail, warehousing, industrial, and agricultural uses. Current residential development includes two manufactured home parks (Wood Haven and Westwood) and single family homes intermixed with other land uses. Retail and service businesses are concentrated along 500 South, between 1100 West and I-15. These businesses provide local services, and a truck stop and hotel adjacent to I-15 also serve highway-related traffic needs. Two other major retail businesses are located on the north side of 500 South between Redwood Road and 1100 West (the Utah Auto Auction and American Country Store).

Warehousing, light industrial development, and other services are concentrated on the east side of Redwood Road between 2600 South and 1180 South, including development

associated with the Skypark Airport. The Holly Refinery is located north of 500 South between the D&RGW and UPRR rail lines in West Bountiful. Woods Cross has two additional refineries beyond the project corridor (Golden Eagle and Silver Eagle). The 2003 Woods Cross General Plan notes that industrial uses (such as the refineries) are highly visible and dominate the perception of the area; however, only 11 percent of the city's land area is devoted to industrial uses.

Some remaining agricultural uses are located along the project corridor, mostly near the intersection of Redwood Road and 500 South. According to the 2003 Woods Cross General Plan, the A-1 (agricultural) zoning assumes that these agricultural uses will eventually transition into more urban uses because agriculture is not considered a viable or desired land use within the city.

3.1.2 Future Land Use and Local Land Use Plans

Both Woods Cross and West Bountiful have developed general or master plans, corridor plans, and zoning ordinances that define specific land uses or restrictions for their respective communities. These plans and ordinances guide land uses including the location and rate of development within each jurisdiction. A variety of local and external factors also influence land use development trends. Localities direct the type and amount of development through planning and zoning controls and water and sewer access. Access to water and sewer are not constraints for development along the project corridor since these services are readily available. Localities do not control external market factors, such as the cost of land, demand for housing or commercial properties, or influences from other major transportation projects such as the Legacy Parkway or Commuter Rail.

The 2003 Woods Cross General Plan focuses on the interaction of land use, urban design, and transportation and is used to evaluate development proposals to implement a desired future for the community. The plan notes that the implementation of the Legacy Parkway project will define the western edge of the community and create development opportunities at its interchange with 500 South. Wood Cross' vision for future land uses is presented in **Figure 3-2**. However, since their plan's publication there have been several modifications. For example, the Land's End Neighborhood west of the planned Legacy Parkway at 500 South is no longer expected to be developed or incorporated (Uresk, August 24, 2006). According to local planners, the extent of planned parks and open space illustrated in **Figure 3-2** would only be realized if it is donated by developers during the site development process (Stephens, September 29, 2005). The 300-foot open space buffer identified along Redwood Road will likely be a 40-foot buffer based on recent negotiations with developers. Additionally, the city has not been able to obtain, nor are they likely to obtain, the land that would be associated with implementing the

Legacy Park and the Woods Cross Regional Field Sports Complex (Stephens, September 29, 2005).

The city's vision for future growth will also be guided by the Woods Cross 500 South Corridor Plan. This plan, which has not yet been adopted, builds on the concepts from the 2003 Woods Cross General Plan to organize future design and engineering efforts to convert 500 South into an attractive gateway. One of the fundamental concepts driving the vision of this plan is the assumption that the improvements associated with the Legacy Parkway and Commuter Rail projects make 500 South a prime location for development and redevelopment. The city is assuming that underutilized parcels and some industrial uses would be redeveloped consistent with the plan. The plan divides the corridor into five districts as part of a Preferred Corridor Concept. As currently drafted, general elements include a 110-foot typical section with a raised center median, incorporating trees and other plantings, and pedestrian connections.

According to the 1992 West Bountiful Master Plan, the city's prime commercial corridors are along 500 South and 500 West. The plan states that office and commercial development should be encouraged along these corridors and existing residential uses should be phased out over time. New residential development planned for West Bountiful is located well north of the project in Birnam Woods and Olsen Farms.

Adjacent to the project corridor, Valentine and Mountain View Estates are in the process of being developed with over 450 residential units west of Redwood Road (as illustrated in **Figure 2-5**). Other large-scale development within the region includes the Foxboro development in North Salt Lake just south and west of the project. The first phase of this master planned community was platted in 2003, having a total of 1,267 residential units on 272 acres. Two additional phases are currently planned, including Foxboro South with 120 residential units and Foxboro North with 1,287 residential units (Ottoson, November 15, 2005). Ultimately, this mixed use development would also include commercial development, pocket parks, a 12.5-acre regional sports complex, an elementary school, two charter schools, churches, and a fire station. Once developed, the community facilities within the Foxboro development would also serve residents along the project corridor and in Woods Cross as a whole.

By the year 2030, 7,436 households and 20,450 people are projected to reside in the traffic influence area (**Figure 1-1**). This residential growth represents an increase of 3,575 households (a 93 percent increase) and 7,945 people (a 64 percent increase) between 2005 and 2030. Total employment for 2030 is projected at 19,467 jobs, representing an 87 percent increase or 9,056 additional jobs (WFRC, 2005a). The recent and anticipated residential growth is focused west of SR-68 in North Salt Lake (Foxboro) and Woods

Cross (Valentine Estates and Mountain View Estates). The regional analysis conducted for the Legacy Parkway project indicates that residential growth trends are anticipated to continue in Davis County, resulting in the annual conversion of approximately 600 acres of low-intensity land uses (i.e., agricultural, grazing, idle) to residential development and 100 acres to non-residential development (UDOT, 2005a).

3.1.3 No Build Alternative

On-going and planned development is expected to occur independent of the proposed project. Therefore, under the No Build Alternative, land along SR-68 is likely to continue to be developed for residential, retail, and industrial uses consistent with local planning.

3.1.4 Build Alternative

As shown in **Table 3.1-1**, the Build Alternative would directly convert nearly six acres of land to transportation use, primarily from land zoned for commercial or industrial uses. Additionally, just over seven acres of permanent easements would be necessary to accommodate cut/fill slopes, retaining walls, utilities, and/or increased stormwater runoff. Construction activities necessary to implement the project would likely temporarily impact just over three additional acres.

TABLE 3.1-1: DIRECT LAND USE CONVERSIONS

City	Zone	Acres Converted to Transportation Use (110' / 94')
West Bountiful	General Commercial (CG)	1.61 / 1.42
Woods Cross	General Commercial (C-2)	0.14 / 0.12
	Light Industrial / Business Park (I-1)	2.71
	Agricultural (A-1)	0.76
	Single Family Residential (R-1-8)	0.26
	Airport (AP)	0.01
Unincorporated Davis County	Zoning not applicable	0.01
North Salt Lake	General Commercial (CG)	0.01
	Manufacturing / Distribution (MD)	0.25
Total Direct Land Use Conversions	--	5.76 / 5.55

Note: The total for the 94-foot ROW Option is inclusive of the entire project limits to provide a comparative total.

Indirect land use impacts are not anticipated as a result of the Build Alternative since improvements are not projected to induce traffic or alter development plans when compared to the No Build Alternative. From a traffic management standpoint, the Build Alternative maintains mobility and is not anticipated to induce new traffic. The project lies in an existing urban area that is served by a network of existing transportation facilities, such as SR-68 and I-15. New transportation corridors, including Legacy Parkway and Commuter Rail, are under construction in this area that will help accommodate planned growth in this area. As such, build out conditions are expected to be the same by the year 2030 and both the No Build and Build Alternatives are projected to have similar 2030 two-way traffic volumes ranging from 12,500 (Redwood Road) to 20,750 (500 South) vehicles daily along the corridor. Additionally, the Build Alternative does not provide new access compared to existing conditions. Therefore, the Build Alternative is not anticipated to induce additional development in the form of new households or employment growth or change the vehicle miles traveled (VMT) through the project area.

As discussed in **Section 2.4.3**, the Build Alternative would provide additional capacity and travel time savings over the future No Build scenario, thus supporting projected travel needs associated with over 3,000 new housing units along Redwood Road in Foxboro, Mountain View Estates, and Valentine Estates. However, since travel times associated with the Build Alternative would be similar to existing conditions, the Build Alternative is not likely to alter the rate of future development. As noted in **Table 3.1-1**, the Build Alternative would directly convert nearly six acres to transportation use; however, the location and magnitude of these impacts are not dramatic enough to alter future development plans. Additionally, a widened roadway has been anticipated in local planning. The Build Alternative does not preclude or limit the planned and approved development. Therefore, the Build Alternative is unlikely to provide the impetus to alter the character of land use.

As discussed in **Section 1.3.1**, the inclusion of improvements to SR-68 in WFRC, UDOT, West Bountiful, and Woods Cross Plans demonstrates that there is both a need and support for the project at the state, regional, and local level. The Build Alternative is generally consistent with these plans as it provides improvements to SR-68. As illustrated in **Figure 2-4**, some design details of the Build Alternative, such as median and shoulder area treatments, will be determined during final design in coordination with local entities. Specific treatments that are determined during final design may or may not be consistent with the Woods Cross 500 South Corridor Plan. For example, as currently drafted the plan suggests the use of large trees in both the median and shoulder area which would be a safety concern because it would be an obstruction within the clear zone. UDOT has been coordinating with Woods Cross and will continue to do so during final design and construction. This continued coordination will allow for greater consistency with local plans.

3.1.5 Mitigation of Land Use Impacts

The primary mitigation for land use impacts is compensation for the acquisition of property, as discussed in **Section 3.3.6**. Coordination with the cities of Woods Cross, West Bountiful, and North Salt Lake has been an on-going process. Constraints were identified early in project scoping and measures that were able to avoid and minimize impacts to land uses important to these communities have been incorporated throughout the development of the Build Alternative through the use of a meandered alignment.

UDOT will continue to coordinate with local entities during final design and construction. Design preferences, such as aesthetic treatments within the median and shoulder areas, will be considered and incorporated to a reasonable extent (i.e., those that do not compromise safety). Additional local funding may be required to implement these aesthetic design preferences that are considered betterments.

3.2 FARMLANDS

The United States Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS) oversees the Farmland Protection Policy Act (FPPA). For the purposes of implementing the FPPA, farmland is defined as prime or unique farmlands or farmland that is determined by the state or unit of local government agency to be farmland of statewide or local importance. However, it does not include farmland already in or committed to urban development or water storage (7 CFR 658.2). Since the land use impacts occur on land already in or committed to urban development (**Figure 3-2**), the requirements of the FPPA do not apply.

3.3 COMMUNITY RESOURCES

The assessment of community resources was modeled after FHWA's community impact assessment (CIA) process (1996). This CIA process focuses on issues that affect the community and the quality of life of its people. The level of detail presented in discussing community character and cohesion, environmental justice populations, public facilities and services, displacements, and recreation resources are proportional with the potential for project-related impacts.

Community resources and potential impacts have been reviewed at the corridor level and at the demographic study area level, as well as for the cities of Woods Cross and West Bountiful, Davis County, and/or the state of Utah. The demographic study area was defined using six Census block groups that encompass the project corridor (**Figure 3-3**). Demographic information was collected from 2000 Census block groups to characterize communities and identify sub-populations within the demographic study area. Data were

also obtained from the WFRC, local plans, public service agencies, interviews with local planners, and field reviews. During the public outreach process, community members provided additional information specific to the project corridor through interviews, questionnaires, and public meetings that augment these data. In 2005, letters and questionnaires were provided to residences and businesses adjacent to the project corridor. Stakeholder interviews were held with many of these residents and businesses, and a neighborhood meeting was held on September 17, 2005 with the Westwood Mobile Home Park (MHP). Public open house meetings were held on November 29, 2005 and August 15, 2006, and a public hearing was held on May 1, 2007. Community outreach and participation is discussed further in **Chapter 6**.

Local general plans and zoning are summarized in **Section 3.1**. There are no local regulations applicable to community character and community cohesion. However, the cities have general social and economic goals to support and strengthen the existing community and its quality of life.

3.3.1 Community Character and Cohesion

Community character and cohesion for residents along the project corridor is a function of the neighborhood and/or city where they reside. Residents along the project corridor are connected to the cities of Woods Cross, West Bountiful, and North Salt Lake, as well as Davis County, through the common use of community focal points such as schools, churches, parks, retail or service establishments, and municipal services as illustrated on **Figure 3-4**. Community focal points located along the project corridor are currently limited to retail and service establishments.

The Woods Cross City General Plan identifies the overall feeling of community cohesion within the city. The plan notes that, "Woods Cross residents generally have positive feelings about their community. They like the convenience of being close to Salt Lake City, the open spaces nearby, good neighborhoods and neighbors, the history of the area, and the parks and lighted streets." The plan further notes that community concerns include air pollution from refineries, groundwater quality, property upkeep, mosquitoes, and a desire for additional community pride and beautification efforts. The residents of the community have noted that they do not have a grocery store nearby.

West Bountiful residents have "both benefits of country living and easy access to large city amenities" (West Bountiful, 1992). As the project corridor essentially forms the very southern edge of the city, overall community cohesion is focused to the north and east.

3.3.1.1 Community Demographics

In 2000, the demographic study area included 6,278 people, accounting for 2.6 percent of Davis County's total population. **Table 3.3-1** summarizes historic and projected population trends. Between 1970 and 2000, the population in Davis County grew by 139,966 people at a rate of 3.0 percent annually. During the same time, Woods Cross and West Bountiful each had similar population gains of over 3,200 people and North Salt Lake grew by over 6,600 people. Between 2000 and 2030, Woods Cross is projected to gain 3,864 people, West Bountiful 1,957 people, and North Salt Lake 4,893 people. Trend data is not available for the demographic study area.

TABLE 3.3-1: POPULATION TRENDS

LOCATION	1970	1980	1990	2000	2010	2020	2030
Woods Cross	3,124	4,263	5,384	6,419	9,237	9,959	10,283
West Bountiful	1,246	3,556	4,447	4,484	4,649	5,403	6,441
North Salt Lake	2,143	5,548	6,474	8,749	12,257	13,397	13,642
Davis County	99,028	146,540	187,941	238,994	304,502	352,320	382,219

Sources: Census Bureau, 2000; GOPB, 2005

Table 3.3-2 provides age comparisons for populations within the demographic study area, cities adjacent to the project corridor, and Davis County. Based on data provided in questionnaires received from community members adjacent to the project corridor, four households identified members under the age of 16 and five households identified members over the age of 65.

TABLE 3.3-2: SCHOOL AGE AND ELDERLY POPULATIONS

LOCATION	Children (Under 18 Years Old)		Elderly (65+ Years Old)		Median Age
	#	Total Population	#	Total Population	
Study Area	2,139	34%	456	7%	NA
Woods Cross	2,312	36%	239	4%	25.5
West Bountiful	1,598	36%	190	4%	26.9
North Salt Lake	2,792	32%	678	8%	28.0
Davis County	83,963	35%	17540	7%	26.8

NA = Not Available

Source: Census Bureau, 2000

Over 45,170 persons (or 21 percent of the civilian non-institutionalized population five years old or older) in Davis County identified themselves with a disability in the 2000 Census. Disabilities included sensory, physical, mental, self-care, go-outside-home, or employment. Based on data provided in questionnaires received from community members adjacent to the project corridor, three households include disabled residents.

3.3.1.2 Neighborhoods and Housing

Figure 3-4 illustrates the neighborhood and community focal points within the demographic study area. Currently, neighborhoods along the project corridor include two manufactured home parks (Westwood and Wood Haven) and single family residences scattered along SR-68. Existing neighborhoods in Woods Cross (Old Town, Farm Meadows, and Mills Park neighborhoods) are buffered from SR-68 by industrial and commercial development. Three major subdivisions are under development west of Redwood Road (Mountain View Estates, Valentine Estates, and Foxboro) and based on site plans, these developments are being set back from Redwood Road and include landscaping and/or fencing to buffer the development from SR-68. These new developments offer new housing stock for Woods Cross, but generally at a higher cost than existing homes along the project corridor. New homes for sale within Mountain View Estates are starting at $250,000, well above the year 2000 median value for owner occupied units in Woods Cross.

As part of the continued public outreach process, many residents and businesses along the project corridor were directly contacted. The following paragraphs summarize findings of these outreach efforts, to provide insight into neighborhood level characteristics and concerns.

Westwood MHP, located south of 500 South in Woods Cross, includes over 70 lots and each lot is individually owned. Owners are part of a neighborhood association and members of the project team attended their annual home owners meeting on September 17, 2005 to discuss the project and identify community concerns. Coordination through meetings and interviews identified traffic safety concerns – especially with children, lack of sidewalks, limited shoulders, a turn lane, and the lack of a traffic light for turning access. Residents noted that they walk or bike along 500 South, but primarily use their cars to travel to work. Transportation improvement suggestions included: adding a median turn lane, sidewalks, or shoulders, installing a traffic signal into the MHP, widening to the north side of 500 South, installing sound barriers, lowering the speed limit, and improving the interchange with I-15. Questionnaires were distributed throughout the MHP, and respondents to the questionnaire provided the following information:

- The tenure of respondents ranged from 3-21 years with an average of 14 years;
- All but one respondent owned their own home;
- All respondents were white and no respondents were Hispanic;
- Several respondents identified family members who were elderly, disabled, or children; and
- When provided, household incomes were low to medium income levels, with at least three households reporting incomes below the 2005 Health and Human Services (HHS) poverty guidelines based on their family size.

Wood Haven MHP, located north of 500 South near I-15 in West Bountiful, includes 46 modular homes. Wood Haven MHP is owned by a single owner, and residents rent their lots but may own or rent their manufactured home. Members of the project team met with the owners of the Wood Haven MHP in September of 2005. The owners indicated that the MHP was the remaining piece of a farm that had been in their family for six generations. The farm was established by Daniel Wood, the namesake of Woods Cross. Interviews and other outreach methods identified concerns for traffic safety, especially turning movements onto 500 South. Residents noted that they walk or bike along 500 South, but primarily use their cars to travel to work. Transportation improvement suggestions included adding a traffic signal and repairing potholes. Questionnaires were distributed throughout the MHP and respondents to the questionnaire provided the following information:

- The tenure of respondents ranged from 7-32 years, with an average of 22 years;
- All respondents were white and no respondents were Hispanic;
- One household identified family members who were disabled; and
- When provided, household incomes were low to medium income levels, but no households reported incomes below the 2005 HHS poverty guidelines based on their family size.

Findings from other residents along the project corridor included concerns such as congestion, safety, truck traffic, and train backups. Suggestions included providing sidewalks and bike lanes, a widened road, grade separation of the UPRR, and better enforcement of speed limits. When provided, household incomes were low to medium income levels, with at least two households reporting incomes below the 2005 HHS poverty guidelines based on their family size.

Housing within the demographic study area consists of predominantly single-family residences. **Table 3.3-3** compares housing characteristics between the demographic study area and the cities of Woods Cross, West Bountiful, North Salt Lake, and Davis County.

TABLE 3.3-3: HOUSING CHARACTERISTICS

LOCATION	Total Housing Units	Vacancy Rate	Number Owner Occupied Units	Number Renter Occupied Units	Median Value Owner Occupied	Median Gross Rent
Study Area	2,149	5.0%	1,734	307	NA	NA
Woods Cross	2,021	4.2%	1,405	531	$146,800	$641
West Bountiful	1,282	2.5%	1,154	96	$154,400	$627
North Salt Lake	3,022	4.9%	2,062	812	$154,800	$645
Davis County	74,114	3.9%	55,195	16,006	$153,100	$637

Source: Census Bureau, 2000

3.3.1.3 Community Facilities

Community facilities and focal points along the project corridor are limited (see **Figure 3-4**). Municipal services within the demographic study area include the Woods Cross Public Works and City Shops on Redwood Road at 1490 South. The municipal centers of Woods Cross and West Bountiful are just beyond the demographic study area and the South Branch Library is located in Bountiful. While some retail and services are located along the project corridor, both cities' main commercial districts are located east of I-15 along US 89. Larger scale commercial establishments are found east of the demographic study area in Bountiful.

Students within the demographic study area attend public schools within the Davis County School District. Currently, students north of 500 South attend West Bountiful Elementary, Bountiful Junior High School, or Bountiful High School. Students south of 500 South attend Woods Cross Elementary, Mill Creek Junior High School, or Woods Cross High School. Of these schools, only Woods Cross Elementary (745 West 100 South) and West Bountiful Elementary (750 West 400 North) are located in the demographic study area. The school district is considering building a new elementary school in Woods Cross or North Salt Lake to address planned and projected residential growth in these areas. A specific site has not yet been selected, but local planners have indicated Foxboro, Mountain View Estates, or Village Green subdivisions could be incorporating a site for a new elementary school (Ottoson, November 15, 2005, and Stephens, September 29, 2005).

Each school within the Davis County School District prepares its own Safe Route to School Plan for students who walk or bicycle to school. In the 2006/2007 school year, SR-68 was not identified as a pedestrian or bicycle route to school in either of the Woods Cross Elementary or West Bountiful Elementary School plans. Students along SR-68 were provided bus transportation to school.

Elderly populations are served by the Utah Department of Human Services, Division of Aging and Adult Services. These services are administered by the Davis County Council on Aging. The closest center is the Golden Years Center at 726 South 100 East in Bountiful. No nursing homes or assisted living facilities are located within the demographic study area.

Several Church of Jesus Christ of Latter-day Saints (LDS) meeting houses are located within the demographic study area. Each meeting house includes congregations known as a ward, with a specific geographic boundary. Two or three wards typically hold worship services and other activities at one meeting house, and ward boundaries are periodically adjusted. Other denominations that may serve residents of the community are located in northern West Bountiful, Bountiful, and Centerville.

Residents of the demographic study area are served by medical facilities in Bountiful (Lakeview Hospital and South Davis Community Hospital). The cities maintain their own law enforcement. The South Davis Fire District serves Woods Cross, West Bountiful, Centerville, and North Salt Lake. Emergency medical response in the form of Emergency Medical Transport (EMT)/paramedic service is coordinated through the South Davis Fire District. Private ambulance service also operates within the county. A new fire station is planned west of Redwood Road near 2600 South as part of the Foxboro development.

Several neighborhood parks are located within the demographic study area in both Woods Cross and West Bountiful; however none are adjacent to the project corridor. Currently, there are no existing trails along the project corridor and sidewalks are not continuous. Planned trails/routes are shown in **Figure 3-4**. Planned off-street trails relevant to the project corridor include the A1/A1-A Trail, the Legacy Parkway Trail, and the D&RGW Rail Trail. The A1/A1-A Trail would cross the project corridor in two places (Redwood Road at 1900 South and 500 South at 1500 West). The Legacy Parkway Trail would be accessed via 2600 South, 1500 South, 500 South, and the A1/A1-A Trail. The D&RGW Rail Trail is completely undeveloped, but in 2002 UTA purchased the D&RGW track north of 500 South. South of 100 North in West Bountiful and Woods Cross, the ROW is still privately owned, and the cities do not expect the D&RGW Rail Trail to cross 500 South.

Utility providers within the demographic study area include Questar (natural gas), Rocky Mountain Power (formerly Utah Power and Light) for electricity, South Davis Sewer District (sewer), and each city provides culinary water. Representatives of Woods Cross have noted that SR-68 is a major utility corridor and includes city-owned utilities as well as utilities owned by other service providers including major petroleum pipelines that serve processing plants in Woods Cross and West Bountiful.

Additional utility infrastructure needs have been identified in the 2006 Davis County Consolidated Plan (Davis County, 2006a). West Bountiful notes that over 50 percent of the culinary water pipes are over 50 years old and need to be replaced. Additionally, about 25 percent of their storm drains need to be replaced. Woods Cross cited the need for increased capacity for storm drains in the western part of the city to accommodate new growth.

3.3.2 Impacts to Community Character and Cohesion

No temporary or permanent change in neighborhood continuity or community cohesion is anticipated with either alternative. SR-68 is an existing facility and widening it would not divide any neighborhoods, remove a community gathering place or community facility, or dramatically alter travel patterns. Potential impacts to community character and cohesion have been minimized through coordination with local stakeholders and by incorporating a design that minimizes residential and commercial displacements through the use of a meandered corridor.

Because the number of potential displacements and overall community impacts is limited, direct or indirect impacts to population and demographics are not anticipated. The Build Alternative would not result in displacements within the Wood Haven or Westwood MHP neighborhoods and no community facilities would be removed. Median treatments may slightly alter how these neighborhoods are accessed. Managing turning movements, improving intersections, and widening shoulders would make turning movements in and out of these neighborhoods safer.

All community members, including residents who are elderly, disabled, or children would experience improved bicycle and pedestrian access, signalization, and local traffic operations. Bicycle and pedestrian improvements include the continuous paved shoulder and sidewalks associated with the Build Alternative. Signalized intersections would be designed to accommodate the special needs of elderly and disabled individuals. These improvements would help connect these neighborhoods with other planned facilities to improve non-motorized accessibility throughout the demographic study area.

The No Build Alternative would not address issues associated with traffic congestion or access management. Without improvements, the 2030 No Build network wide delay is almost five times as great as the 2005 network wide delay (320 seconds per vehicle in the 2030 No Build condition, compared to 68 seconds per vehicle in 2005). Inadequate capacity to handle existing and future traffic levels would result in inconvenience and delay for motorists accessing residences, businesses, and community resources. The Build Alternative would provide travel time savings compared to the No Build Alternative. However, temporary traffic impacts during construction would include possible detours, lane closures, and/or temporary accesses. Short-term disruptions in utility service during construction may also be necessary. These impacts are temporary and of short duration; and as such, they are not expected to alter community character or cohesion.

Changes in access and corridor travel times for residents, businesses, and emergency service providers are further discussed in **Section 2.4** and **Section 3.5**.

3.3.3 Environmental Justice Populations

Executive Order 12898 requires that all federal agencies identify and address whether their actions have a disproportionately high and adverse human health or environmental effect on Environmental Justice populations. Environmental Justice populations are made up of either minority and/or low-income populations. Minority and low-income populations within the demographic study area were identified using the 2000 Census block group data. Community members adjacent to the project corridor were also asked to augment Census data specific to the project corridor. This additional data was collected through interviews, questionnaires, and public meetings that occurred as part of the project's public outreach process.

Table 3.3-4 compares the racial minority populations for the demographic study area to the cities and Davis County. Davis County has a racial minority population (non-white) of 7.7 percent, which is greater than the demographic study area (4.3 percent). **Table 3.3-4** does not include data for Hispanic populations because "Hispanic" is an ethnic minority designation and persons of this ethnicity may be of any race. In the 2000 Census, 257 Hispanic residents accounted for 4.1 percent of the demographic study area, compared to 5.4 percent in Davis County. No ethnic or racial minority residents adjacent to the project corridor were identified based on responses to questionnaires provided by community members.

TABLE 3.3-4: RACIAL MINORITY POPULATIONS

LOCATION	Black or African American Alone	American Indian and Alaska Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Some Other Race Alone	Two or More Races
Study Area	15 (< 1%)	17 (< 1%)	64 (1%)	6 (< 1%)	79 (1%)	88 (1%)
Woods Cross	28 (< 1%)	16 (< 1%)	45 (< 1%)	17 (< 1%)	164 (2%)	131 (2%)
West Bountiful	1 (< 1%)	16 (< 1%)	25 (< 1%)	29 (< 1%)	37 (< 1%)	61 (1%)
North Salt Lake	27 (< 1%)	88 (1%)	131 (1%)	37 (< 1%)	210 (2%)	154 (1%)
Davis County	2,615 (1%)	1,379 (< 1%)	3,665 (1%)	639 (< 1%)	5,501 (2%)	4,709 (2%)

Source: Census Bureau, 2000

Low-income populations are more difficult to identify than minority populations because of privacy issues regarding income levels and the lack of existing data sources at a geography smaller than the Census block group level. FHWA's Executive Order 12898 on Environmental Justice identifies the HHS poverty guideline as the basis for identification of low-income populations. The poverty guidelines are issued annually and vary based on the family unit size and location (i.e., continental United States, Alaska, or Hawaii). For example, the 2005 poverty guideline for a family of two in the 48 contiguous states was $12,830 while a family of four was $19,350. Fortunately, the Census poverty level is a measure that is generally comparable to the HHS poverty guideline. The main disadvantage of the Census poverty data for the low-income analysis is that the data are only available at a Census block group level (a broader geographic level) and currently only 1999 data are reported.

Census block group data indicate there are 180 residents within the demographic study area with incomes below the poverty level, or approximately three percent of the population. **Table 3.3-5** compares the demographic study area low-income population to the cities and Davis County. Based on a comparison of reported income correlated with family size and HHS 2005 poverty guidelines, four low-income households were identified based on data provided in questionnaires.

TABLE 3.3-5: LOW-INCOME POPULATIONS

LOCATION	Persons with Incomes Below Poverty Level	Percent of Total Population with Income Below Poverty Level
Study Area	180	2.8%
Woods Cross	304	4.7%
West Bountiful	147	3.3%
North Salt Lake	288	3.3%
Davis County	11,984	5.0%

Source: Census Bureau, 2000

In summary, based on data provided in questionnaires by community members adjacent to the project corridor, low-income populations are located in Westwood MHP, Wood Haven MHP, and along Redwood Road. While every household was provided a questionnaire and encouraged to participate in the public involvement process, not every household responded to all questions and it is possible that there are additional low income households as well as minorities along the project corridor.

3.3.4 Impacts to Environmental Justice Populations

The following evaluation for environmental justice considerations was modeled after the concepts outlined in Executive Order 12898. This Executive Order directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law.

The following procedures were included in the study process:

- Make active efforts to determine whether minority or low-income populations are present and include them in the transportation decision-making process;
- Consider reasonably foreseeable direct, indirect, and cumulative effects on minority and low-income populations;
- Consider whether minority and low-income populations share equally in the benefits of the transportation project;

- Determine whether disproportionately high and adverse impacts to minority or low-income populations would occur; and
- To the extent practicable, avoid, minimize, and mitigate adverse impacts to minority and low-income populations.

Project outreach to determine if environmental justice populations exist within the project corridor occurred throughout the project development process. Outreach included public open house meetings, neighborhood meetings, questionnaires, stakeholder interviews, newsletters, flyers, and informal meetings. This outreach is further discussed in **Chapter 6**. Community outreach activities confirmed that minority and low-income residents are part of the broader community, as opposed to being concentrated in primarily minority or low-income neighborhoods.

Specific concerns of environmental justice populations identified during the public outreach process include:

- Concern for potential displacement and economic hardship to relocate;
- Concern for loss of nearby businesses used along the corridor; and
- Concern that if displaced, a modular home may not be accepted at a new site because of its age.

In addition to public outreach for this project, local agencies regularly coordinate with and address the needs of the area's minority and low-income residents. For example, the 2006 Davis County Consolidated Plan was developed to identify local needs and guide the expenditure of community development funds like the Housing and Urban Development (HUD) Community Development Block Grant funds. This study identified the lack of affordable housing opportunities, the preservation of Hill Airforce Base, and community development needs such as the preservation of open space and alleviation of congestion as the greatest areas of concern for Davis County.

Impacts to minority and low-income populations would be similar to those experienced by non-minority and non-low-income populations. The No Build Alternative would not improve mobility, would not provide safer turning movements, and would not accommodate multi-modal corridor uses. The Build Alternative would provide those improvements, but would also result in displacements. Displacements within Westwood and Wood Haven MHPs were avoided using a meandered alignment. Other residential and business displacements were minimized using this same approach.

Figures 3-5 and **3-6** illustrate the location of the project corridor relative to racial and ethnic minority populations and low-income populations. Based on a review of 2000 Census data, 2005 property value assessments, and public outreach to community members adjacent to the project corridor, no minority residents are expected to be displaced by the Build Alternative. While many of the residential displacements are to modest income households, none of these households have been identified as low-income per HHS poverty guidelines. Relocation assistance, discussed in **Section 3.3.6**, is available to all relocatees without discrimination.

Many residents, including low-income residents, have expressed concerns regarding changes in access due to median treatments. While these treatments will be determined in final design, it is not likely to result in different impacts to minority or low-income residents as compared to non-minority and non-low-income residents.

In summary, the Build Alternative was designed to avoid displacements to low-income residents. Additionally, the travel benefits provided by the Build Alternative throughout the project corridor benefit all residents including low-income and minority populations. Therefore, the Build Alternative would not result in a disproportionately high and adverse effect on minority or low-income populations.

3.3.5 Property Acquisition and Potential Relocation Impacts

The No-Build Alternative would not require additional property acquisition or potential relocation of residences or businesses. As illustrated in **Figures 2-5** and **2-6**, the Build Alternative would result in partial property acquisitions (i.e. strip takes) along the meandered corridor. The Build Alternative would also potentially displace up to nine residences and five businesses (**Table 3.3-6**), most of which occur within West Bountiful along 500 South. The 94-foot ROW Option eliminates the need for all four potential business displacements within this short section between 800 West and 700 West.

TABLE 3.3-6: POTENTIAL DISPLACEMENTS

Address	City	Name of Business	110-foot	110-foot w/94-foot Option (Preferred)
918 South 1800 West	Unincorporated Davis County	Scales for Coalt, Inc.	Combined Residence & Business	Combined Residence & Business
1156 West 500 South	West Bountiful		Residence	Residence
1030 West 500 South	West Bountiful		Residence	Residence
1031 West 500 South	West Bountiful		Residence	Residence
965 West 500 South	West Bountiful		Residence	Residence
841 West 500 South	West Bountiful		Residence	Residence
829 West 500 South	West Bountiful		Residence	Residence
772 West 500 South	West Bountiful		Residence	Residence
756 West 500 South	West Bountiful	South Davis Mill & Cabinet	Business	
746 West 500 South	West Bountiful		Residence	Residence
730 West 500 South	West Bountiful	Bountiful Collision	Business	
724 W 500 South, Suite 200	West Bountiful	Bob's Tree Service	Business	
724 W 500 South, Suite 100	West Bountiful	Entertainment Book	Business	
Total Potential Displacements			**9 Residences 5 Businesses**	**9 Residences 1 Business**

Note: The total for the 94-foot ROW Option is inclusive of the entire project limits to provide a comparative total. Totals for the 110-foot ROW have assumed that the West Bountiful Business Park building at 724 West 500 South can be reconfigured to limit business displacements to the two businesses fronting 500 South (Bob's Tree Service and Entertainment Book).

Displaced businesses would have multiple relocation options within West Bountiful and Woods Cross. Displaced businesses may relocate into comparable vacant buildings along the project corridor, and some may be able to rebuild on the same parcel or build on a different parcel. New development or redevelopment to accommodate displaced businesses is consistent with local plans and most of the corridor is zoned for commercial and industrial uses. Further discussion of the economic impact of business displacements is found in **Section 3.4.3.**

Based on Davis County tax assessor data and interviews with corridor residents, the displaced residences have a total market value ranging from $91,000 to $169,000 with an average value of $128,976 (Davis County, 2006b). The availability of replacement housing was determined based on a review of Census data and local real estate options available in September 2006. As identified in **Section 3.3.1.2** (**Table 3.3-3**), each of the cities has

residential vacancy rates between two to five percent, including over 100 vacant housing units within the demographic study area. Over 28 properties were available in Woods Cross and West Bountiful in zip code 84087 (Realtor.com, 2006). However, only one of these properties was priced below the average value of the displacements ($128,976) with most of the available homes priced in the low $200,000s. Additional options for replacement housing are discussed in **Section 3.3.6**.

3.3.6 Mitigation Measures for Community Impacts

Property acquisition will be conducted in accordance with Title VI of the Civil Rights Act of 1964 and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended (the Uniform Act). Relocation services and benefits will be administered through UDOT's Relocation Assistance Program. Relocation resources are available to all relocatees without discrimination. UDOT will provide comparable replacement housing that is decent, safe, and sanitary and within the financial means of the displacees. Due to the limited number of properties below the average value of the displacements, UDOT may provide the necessary housing in a number of ways, such as providing a replacement housing payment in excess of the maximum $5,250 or $22,500 statutory limits or purchasing an existing comparable dwelling in exchange for the displaced dwelling.

The following commitments will also be incorporated into the project to minimize community impacts and related concerns that have been expressed by community members:

- Landscaping and median treatments will be considered during final design in coordination with Woods Cross and West Bountiful;
- Sidewalks and paved shoulders will be incorporated in the design to provide additional bicycle and pedestrian circulation to the community;
- UDOT standards for traffic control management will be implemented to coordinate the efficiency and safety of construction activities throughout the duration of the construction project;
- UDOT will coordinate the timing of construction with the timing of other transportation projects in the area (i.e. Legacy Parkway and Commuter Rail) to minimize the level of disruption and inconvenience to the community; and
- UDOT will consider signalization of intersections along the corridor that meet signal warrants. Signalized intersections will be designed to accommodate the special needs of elderly and disabled individuals.

3.4 ECONOMICS

3.4.1 Economic Setting

As discussed in **Section 3.1.1**, retail and service businesses are concentrated along 500 South, between 1100 West and I-15. Two other major retail businesses are located on the north side of 500 South between Redwood Road and 1100 West (the Utah Auto Auction and American Country Store). The Holly Refinery is also located along 500 South between the D&RGW and UPRR rail lines in West Bountiful. Other services, warehousing, and light industrial development are concentrated on the east side of Redwood Road between 2600 South and 1180 South, including development associated with the Skypark Airport.

Davis County's regional economy is diversified between the sectors of manufacturing, trade, services, and government. Some of the county's largest employers include Hill Air Force Base, Davis County School District, Lagoon Corporation, Inc., Lifetime Products, Smith's Marketplace, Wal-Mart, Albertson's, Citicorp Credit Services, and Davis County government (Department of Workforce Services, 2005). **Table 3.4-1** summarizes some key economic indicators for Davis County. Over 8,400 jobs and 1,200 businesses were added to the county between 2000 and 2004.

TABLE 3.4-1: DAVIS COUNTY ECONOMIC TRENDS

	2000	2001	2002	2003	2004*	Change 2000-2004
Labor Force	122,671	123,005	124,391	124,837	126,597	3%
Unemployment Rate	3.6%	3.8%	5.2%	5.2%	4.4%	NA
Total Non-farm Employment	84,846	87,579	88,920	89,696	93,284	10%
Total Establishments	4,993	5,255	5,513	5,751	6,196	24%
Total Wages ($ Millions)	2,333.2	2,514.9	2,644.4	2,783.6	2,961.5	27%

Source: Department of Workforce Services, 2005

*Only preliminary 2004 data is available.

These growth trends are anticipated to continue for both the demographic study area and the county as a whole. Woods Cross is projected to add over 4,800 new jobs between 2005 and 2030, while West Bountiful is projected to add over 1,000 jobs over the same time frame (WFRC, 2003a). Similar employment growth trends have also occurred along the project corridor, with the addition of new service and retail establishments.

Table 3.4-2 summarizes recent tax revenue trends in Davis County. In 2004, gross taxable sales in Woods Cross represented eight percent of Davis County's gross taxable sales and West Bountiful represented three percent. Both Woods Cross and West Bountiful have identified the need to diversify and expand their commercial tax base. Both cities hope to develop large scale retail, Woods Cross in the west side of the city near the planned Legacy Parkway interchange at 500 South, and West Bountiful at the 400 North/I-15 interchange area (Davis County, 2006a).

TABLE 3.4-2: DAVIS COUNTY TAX REVENUE TRENDS

	2000	2001	2002	2003	2004	% Change 2000-2004
Total assessed valuation ($ thousands)	9,267,151	10,165,863	10,542,073	12,036,142	11,449,110	24%
Property taxes charged, by all taxing units ($ thousands)	116,696	127,398	132,515	158,305	149,600	28%
Gross taxable sales ($ thousands)	2,561,946	2,690,460	2,759,165	2,795,944	3,026,294	18%
Net local sales tax allocations ($ thousands)	28,160	29,119	29,632	29,615	31,017	10%

Source: Utah State Tax Commission, 2004

3.4.2 No Build Alternative

Since no businesses would be displaced with the No Build Alternative, no direct economic impacts are expected. As explained in **Chapter 2**, the No Build Alternative would not address issues associated with traffic congestion. Traffic congestion would inconvenience and delay patrons accessing businesses located on SR-68. The project corridor also has a large proportion of trucking and industrial related businesses. These large vehicles require a larger turning radius than other vehicles. Since geometric deficiencies would not be corrected, large commercial vehicles will continue to have difficulty with turning movements under the No Build Alternative.

3.4.3 Build Alternative

Direct economic impacts would result from potential business displacements identified in **Section 3.3.5**. The Build Alternative would result in five business displacements, four of which are located within West Bountiful. The 94-foot ROW Option would reduce business displacements to only a single business displacement in unincorporated Davis County. Potentially displaced businesses are service related and considered small businesses. As these businesses are service oriented, sales tax revenue impacts to West Bountiful are anticipated to be minimal. The Build Alternative is estimated to

temporarily remove fewer than 25 jobs. Because of the amount of commercially and industrially zoned parcels along the project corridor, as well as vacant office space, it is estimated that these businesses would be able to easily relocate within the area.

Other businesses may also experience impacts, such as loss of parking or signage. The extent of these impacts, or damages, will be assessed by UDOT appraisers during the design and ROW property acquisition process (see **Section 3.3.6**). Businesses most likely to experience these types of impacts include: America's Country Store, Grandview Rockery, Hugoe Trucking, Dave Co Auto Sales, Holly Refinery, South Davis Mill and Cabinet, and Salt Lake Imports.

With the Build Alternative, overall accessibility would support the local economy by providing travel time savings to patrons of businesses along the corridor. The Build Alternative also improves the accessibility of large commercial vehicles with an additional 12-foot lane in each direction, paved shoulders, turn lanes, and improved intersection geometrics such as increased curb radii. Median treatments could slightly alter how patrons access individual businesses. For example, some driveway accesses may become right-in / right-out accesses. Also, when reasonable and in accordance with UDOT policy, businesses access points may be consolidated. This is consistent with local coordination and plans (see letter dated August 23, 2005 in **Appendix A**).

The Build Alternative would not permanently alter the overall local traffic patterns. However, during construction, patrons may have a more difficult time getting to and from businesses because of restricted lanes of travel, reduced speed limits, and moderate delays. Businesses would be able to remain open with temporary construction access. The increased difficulty to access businesses during construction is not expected to result in additional loss of businesses because the duration of this impact is limited. Business owners who are interested in ways that they can proactively plan for and successfully cope with construction are encouraged to obtain a copy of UDOT's Partners for the Road Ahead (UDOT, 2006a). This business guide is available online at www.udot.utah.gov/business-guide and copies will also be available at the public hearing for this project.

Review of local plans and coordination with the public, business owners, and local government representatives has also identified that aesthetically pleasing design features would make the proposed improvement more compatible with Woods Cross' vision for the corridor that includes creating a unique "sense of place" to support both community and economic goals. Linking I-15 and the planned Legacy Parkway, 500 South is a key facility for conveying traffic and providing access to future development.

3.4.4 Mitigation for Economic Impacts

Mitigation measures to offset adverse economic impacts include those identified in **Section 3.3.6**, as well as the following additional commitments:

- Access to businesses will be maintained throughout construction;
- Where amenable to the property owner and in accordance with UDOT policy, consolidation of driveway accesses will be considered in the design phase; and
- UDOT's business guide, Partners for the Road Ahead, was made available to businesses at the public hearing. This packet of materials is available to assist businesses in proactively planning for and successfully coping with construction (also available online at www.udot.utah.gov/business-guide).

3.5 TRAVEL PATTERNS AND ACCESSIBILITY

Travel patterns and accessibility to local businesses and residences are discussed in **Sections 3.3** and **3.4.** This section provides a brief summary of general travel patterns and accessibility throughout the project corridor, with and without the project. As a UDOT-designated urban principal arterial, SR-68 provides connectivity to I-15 and I-215, as well as many of the urbanized area's primary transportation facilities and the Skypark Municipal Airport. This section of SR-68 is also currently used as a local reliever for a short section of I-15 in the event of delays on I-15. Along SR-68, vehicles can not pass slower moving vehicles because there is only one lane of travel in each direction. The narrow cross-section also makes it difficult for large vehicles to turn without overlap into on-coming traffic, which is a safety concern. Other deficiencies affecting traffic movements are discussed in **Chapter 1**.

Vehicular traffic currently using SR-68 will be affected by both the planned Legacy Parkway and Commuter Rail projects. The Legacy Parkway will add a north / south route west of Redwood Road, and includes an interchange at 500 South. The Commuter Rail project will attract additional transit users to this route. The intersection of 700 West and 500 South will become the primary access for the Woods Cross Commuter Rail Station. This station will provide parking for between 600 and 700 vehicles and TOD is being considered west of the tracks. Representatives of Woods Cross have noted that access to the Woods Cross Commuter Rail Station and associated TOD should be a key component of the design of the proposed SR-68 project (see fax dated August 29, 2006 in **Appendix A**). Additionally, 800 West south of 500 South was recently closed.

Under the No Build conditions, existing travel patterns would become more difficult as congestion increases. The Build Alternative would not alter overall travel patterns but would improve overall accessibility compared to future No Build conditions by providing

travel time savings along the corridor. The Build Alternative would also better accommodate turning movements with an additional 12-foot lane in each direction, paved shoulders, turn lanes, and improved intersection geometrics. Median treatments could slightly alter access to individual properties. For example, some driveway accesses may become right-in / right-out accesses. Where reasonable, other accesses may be consolidated.

3.6 AIR QUALITY

Consistent with NEPA and as further detailed in 23 CFR 771, projects must be evaluated for potential human environment air quality impacts. Additionally, the Federal Clean Air Act (CAA) has established specific procedures and limitations for evaluating transportation projects in designated air quality nonattainment areas. These procedures, generally referred to as the "conformity regulations," are outlined in 42 USC 7401 (et. seq.) and are further detailed in 40 CFR 93. Although separate from the NEPA process, the conformity regulations also require a review of the potential transportation air quality impacts on the human environment.

Two notable differences exist between NEPA and CAA project level air quality requirements. NEPA applies to federal projects regardless of location, whereas the CAA applies to projects within specifically identified areas. Also, NEPA regulations provide limited detail on direction and criteria for project level air quality analyses, whereas the CAA and its implementing regulations provide substantial detail. Both NEPA and CAA project level analysis apply National Ambient Air Quality Standards (NAAQS) for the relevant pollutants as the criteria for evaluating proposed projects and actions.

3.6.1 Existing Air Quality Conditions

The nearest air quality monitor is located in Bountiful, Davis County (ID #490110004) at 171 West 1370 North, approximately 1.5 miles to the north and east of the project. It is a suburban land use monitor with a monitoring objective to help determine population exposure in the region. This site currently monitors Particulate Matter ($PM_{2.5}$ and PM_{10}), Sulfur Dioxide, and Nitrogen Dioxide. Ozone is no longer monitored in Davis County; however, the monitor collected Ozone levels up to the year 2005 and always attained the standard (the three-year average of the fourth-highest daily maximum eight-hour average). Carbon Monoxide (CO) was previously collected in Davis County at another Bountiful location (ID# 490110001) at 65 West 300 South, but the site was discontinued in 2003. In the last 10 years of available data, the monitor always recorded CO levels well below the NAAQS.

Davis County is in attainment of the CO standard and the eight-hour Ozone standard. As a result, no federal action has been taken for conformity purposes. Davis County was

previously designated as being in maintenance for the Environmental Protection Agency (EPA) revoked one-hour Ozone standard. However, it is in attainment for the new eight-hour standard as of June 15, 2005. The Division of Air Quality (DAQ) developed a new Ozone maintenance plan based on the former maintenance plan. DAQ adopted it in 2006, submitted it to EPA in 2007, and it is currently under review. The new maintenance plan is required where the old one-hour standard has been revoked. There will not be emission budgets in this maintenance plan to conform to, since the new plan will not include mobile source emission limits. The project is also in an area designated as being in attainment for both $PM_{2.5}$ and PM_{10}.

3.6.2 Air Quality Impacts

The project is in an attainment area for all NAAQS criteria pollutants; therefore, regional air quality conformity requirements do not apply. As explained in **Sections 2.4.3** and **3.1.4**, there is no predicted change in the average daily traffic (ADT) or vehicle miles traveled (VMT) as a result of the proposed action and the addition of through-lane capacity will improve the LOS and reduce the average vehicle delays over the No Build condition. Consequently, the proposed action will not impact or change the attainment status of the NAAQS. Air quality impacts have been evaluated per UDOT's Air Quality Guidance (2003). Ozone is a regional pollutant and not evaluated at the project level. As such, CO, $PM_{2.5}$, and PM_{10} are the pollutants that have been evaluated. Mobile Source Air Toxics (MSATs) are also addressed.

3.6.2.1 Carbon Monoxide

CO was screened through the process defined in the UDOT Air Quality Hot Spot Manual, Section C (UDOT, 2003). Maximum existing mainline ADT on SR-68 is 17,205 vpd and the predicted design year mainline vpd is predicted to be 20,750. The screening threshold for maximum mainline traffic volumes that do not require CAL3QHC modeling is 30,000 vpd in the existing year and 50,000 vpd in the design year. The screening threshold for maximum intersection traffic volumes that do not require CAL3QHC modeling is 20,000 vpd in the existing year, 25,000 vpd in the design year No Build condition, and 45,000 vpd in the design year Build condition. The existing and proposed traffic volumes are below these screening thresholds for CO and pass the screening test. Therefore, no predicted NAAQS criteria impacts are anticipated. Additionally, other road widening projects on SR-68 (from 10400 South to Bangerter Highway in Salt Lake County) with higher predicted volumes did not result in CO levels that were above the NAAQS. No further analysis or mitigation is required.

3.6.2.2 Particulate Matter

Quantitative analyses tools for $PM_{2.5}$ and PM_{10} are not yet approved for use. Pending the release of official EPA hot spot quantitative tools, EPA's guidance for qualitative analysis for PM_{10} and $PM_{2.5}$ was followed. This guidance is described in EPA's final rule (71 FR 12468) that was signed by EPA and FHWA on March 29, 2006. Since the project is in an area designated as being in attainment for both $PM_{2.5}$ and PM_{10}, no further analysis is necessary.

3.6.2.3 Mobile Source Air Toxics

In addition to the NAAQS, EPA also regulates air toxics. Air toxics are pollutants that may cause cancer or other serious health effects or adverse environmental effects. Most air toxics originate from human-made sources, including road mobile sources, non-road mobile sources (e.g., airplanes), and stationary sources (e.g., factories or refineries). According to EPA, "People exposed to toxic air pollutants at sufficient concentrations and durations may have an increased chance of getting cancer or experiencing other serious health effects. These health effects can include damage to the immune system, as well as neurological, reproductive (e.g., reduced fertility), developmental, respiratory and other health problems. In addition to exposure from breathing air toxics, some toxic air pollutants such as mercury can deposit onto soils or surface waters, where plants take them up and ingested by animals and are eventually magnified up through the food chain. Like humans, animals may experience health problems if exposed to sufficient quantities of air toxics over time." (See document www.epa.gov/air/toxicair/newtoxics.html.)

MSATs are a subset of the 188 air toxics defined by the Clean Air Act. MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. (See document No. EPA420-R-00-023, dated December, 2000.)

EPA is the lead Federal Agency for administering the Clean Air Act and has long been concerned with the health effects of MSATs. (See document No. EPA400-F-92-004, dated August, 1994.) On March 29, 2001, EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources (66 FR 17229). This rule was issued under the authority in Section 202 of the Clean Air Act, and the rule's preamble provides the following summary information regarding the effects and control of MSATs:

> Today's action addresses emissions of hazardous air pollutants (HAPs) from motor vehicles and their fuels. Hazardous air pollutants refer to a range of compounds that are known or suspected to have serious health or environmental impacts. Motor vehicles are significant contributors to national emissions of several hazardous air pollutants, notably benzene, formaldehyde, 1,3-butadiene, acetaldehyde, and diesel particulate matter and diesel exhaust organic gases.
>
> In today's action, we list 21 compounds emitted from motor vehicles that are known or suspected to cause cancer or other serious health effects. Our Mobile Source Air Toxics (MSAT) list includes various volatile organic compounds (VOCs) and metals, as well as diesel particulate matter and diesel exhaust organic gases (collectively DPM + DEOG). The selection methodology we used to develop this MSAT list, which may be used to add compounds to or remove compounds from the list in the future as new information becomes available, is also described. In today's action we also examine the mobile source contribution to national inventories of these emissions and the impacts of existing and newly promulgated mobile source control programs, including our reformulated gasoline (RFG) program, our national low emission vehicle (NLEV) standards, our Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and our proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 1990 and 2020, we project these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 67 to 6 percent, and will reduce on-highway diesel PM emissions by 90 percent.

On February 26, 2007, EPA issued Final Rules on Control of Hazardous Air Pollutants from Mobile Sources (72 FR 8427) that fulfill a commitment made in the 2001 rule to further reduce MSAT emissions. As a result of this review, EPA adopted new requirements to significantly lower emissions of benzene and other MSATs by: (1) lowering the benzene content in gasoline; (2) reducing non-methane hydrocarbon exhaust emissions from passenger vehicles operated at cold temperatures; and (3) reducing evaporative emissions that permeate through portable fuel containers.

In the 2001 rulemaking, EPA identified 21 air toxic compounds emitted from mobile sources, including six priority MSATs: acetaldehyde, benzene, formaldehyde, diesel exhaust, acrolein, and 1, 3 butadiene (66 FR 17230). EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized

MSATs was taken from EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures:

- **Benzene** is characterized as a known human carcinogen for all routes of exposure based upon convincing human evidence as well as supporting evidence from animal studies.

- The potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure. There are no adequate human studies of the carcinogenic potential of acrolein. Collectively, experimental studies provide inadequate evidence that acrolein causes cancer in laboratory animals.

- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals. Human data include nine studies that show statistically significant associations between site-specific respiratory neoplasms and exposure to formaldehyde or formaldehyde-containing products. An increased incidence of nasal squamous cell carcinomas was observed in long-term inhalation studies in rats and in mice. The classification is supported by in vitro genotoxicity data and formaldehyde's structural relationships to other carcinogenic aldehydes such as acetaldehyde.

- **1,3-butadiene** is characterized as carcinogenic to humans by inhalation. This characterization is supported by the total weight of evidence provided by the following: (1) sufficient evidence from epidemiologic studies of the majority of U.S. workers occupationally exposed to 1,3-butadiene, either to the monomer or to the polymer by inhalation, showing increased lymphohematopoietic cancers and a dose-response relationship for leukemias in polymer workers, (2) sufficient evidence in laboratory animal studies showing that 1,3-butadiene causes tumors at multiple sites in mice and rats by inhalation, and (3) numerous studies consistently demonstrating that 1,3-butadiene is metabolized into genotoxic metabolites by experimental animals and humans. The specific mechanisms of 1,3-butadiene-induced carcinogenesis are unknown; however, the scientific evidence strongly suggests that the carcinogenic effects are mediated by genotoxic metabolites of 1,3-butadiene, i.e., the monoepoxide, the diepoxide, and the epoxydiol.

- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.

- **Diesel exhaust** is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.

As noted, EPA is the lead Federal government agency responsible for the establishment of national air quality standards, national guidance and guidelines for the uniform and scientifically reliable study of air pollutants. To date, EPA has developed limited air quality standards for MSATs and no national guidelines or guidance to study MSATs under various climatic and geographic situations. Such limitations make the study of MSAT concentrations, exposures and health impacts difficult and uncertain. Thus, accurate and reliable estimates of actual human health or environmental impacts from transportation projects and mobiles source air toxics are not scientifically possible at this time.

As EPA has not issued air quality standards for all the MSATs, it has not established toxicity factors for diesel particulate matter, although some agencies believe this pollutant accounts for a large portion of MSAT health risk in certain situations. Since the analysis of air toxics is an emerging field, the U.S. Department of Transportation and EPA are currently working to develop and evaluate the technical tools necessary to perform air toxics analysis, including improvements to emissions models and air quality dispersion models. Limitations with the existing modeling tools preclude performing the same level of analysis that is typically performed for other pollutants, such as carbon monoxide. FHWA's ongoing work in air toxics includes a research program to determine and quantify the contribution of mobile sources to air toxic emissions, the establishment of policies for addressing air toxics in environmental reports, and the assessment of scientific literature on health impacts associated with motor vehicle toxic emissions.

Qualitative analyses for MSATs are described in the FHWA's Interim Guidance on Air Toxic Analysis in NEPA Documents (FHWA, 2006a). For this minor widening project (less than 140,000 annual ADT), the amount of MSATs emitted would be proportional to the VMT. Because the estimated VMT under the Build Alternative (either the 110-foot ROW or 94-foot ROW Option) is the same as the No Build Alternative, it is expected there would be no difference in overall MSAT emissions for the Build Alternative. Also, emissions would likely be lower in the design year than the present levels as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020. Though local conditions may differ, the magnitude of the EPA-projected reductions is so great (even accounting for VMT growth) that MSAT emissions in the project corridor are likely to be lower in the future in nearly all cases.

The science and modeling of project specific MSAT impacts has not developed to the point where there is certainty or scientific community acceptance. Accordingly, information on MSAT impacts on any of the alternatives in this EA is not available, and the means to obtain this information have not been fully developed. When this is the case, 40 CFR 1502.22(b) requires FHWA to address four provisions: 1) A statement that such information is incomplete or unavailable; 2) A statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; 3) A summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and, 4) The agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. These provisions have been addressed as follows:

1) Project specific MSAT analysis is an emerging field and the science has not been fully developed. FHWA is aware that MSAT releases to the environment cause some level of pollution. What is not scientifically definable is the exact level of human health or environmental impacts that will result from the construction of new transportation facilities or modification of existing facilities. Understanding and evaluating the rate of emissions and where they move from the point of release is one of the most important first steps in evaluating potential human health or environmental impacts. Current emission data and models are highly uncertain because many of the technical tools necessary to perform this type of analysis, for example accepted models, have serious shortcomings. Likewise, health standards have not been developed for all of the priority MSATs. Most of the necessary technical tools and standards are developed by EPA or other agencies that FHWA has no control or influence over. Further, FHWA does not have statutory authority to set or modify a health standard. Therefore, regarding project specific MSATs analysis, there is both incomplete and unavailable information. Given uncertainties in the generation of information that would be used to model off-site movement of MSATs from a transportation facility, subsequent calculated concentrations would be equally uncertain. Thus, current scientific techniques, tools, and data make it virtually impossible to accurately estimate actual human health or environmental impacts that would result from a transportation project.

2) Without this project specific MSATs analysis, it is impossible to quantitatively evaluate the air toxic impacts at the project level. Therefore, this unavailable or incomplete information is very relevant to understanding the "significant adverse impacts on the human environment." While our ability to identify or project local

MSAT emissions or risk is constrained, we are aware of the importance of these issues. Project-level MSAT risk assessment involves four major steps: emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then risk calculation based on the estimated exposure. Each of these steps is currently encumbered by technical shortcomings that prevent a formal determination of the MSAT impacts of this project. The particulate emissions rates from the official EPA emissions model (MOBILE6.2) are not sensitive to vehicle speed, which is an important determinant of emissions rates (this is a shortcoming for diesel particulate matter, but not the remaining priority MSATs). The available dispersion models have not been successfully validated for estimating ambient concentrations of particulate matter or reactive organic MSATs. Available exposure models are not well designed to simulate roadside environments. A review of available scientific information indicates that MSAT releases to air will cause pollution and could have some level of human health or environmental impact. Unfortunately, for project level transportation analyses, the USEPA and scientific community have yet to develop sufficiently reliable tools, materials, methods, and analysis techniques to accurately predict actual human health or ecological impacts resulting from highway construction. Future research and development activity by USEPA and the scientific community may provide regulated parties, such as FHWA, with such tools in the future.

3) The summary of existing credible scientific evidence primarily consists of the work by EPA, as it is the lead Federal agency in this area. EPA has found that air toxics do have adverse health impacts, including both cancer and non-cancer effects. Even though the tools necessary to quantify the levels and assess the risks of these pollutants are not fully developed, EPA has imposed nationwide controls on vehicles and fuels in order to reduce emissions of these pollutants.

4) Even though there is no accepted model or accepted science for determining the impacts of project specific MSATs, as noted above, EPA predicts that its national control programs will result in meaningful future reductions in MSAT emissions, as measured on both a per vehicle mile and total fleet basis. FHWA believes that these projections are credible, because the control programs are required by statute and regulation. Also, since all of the build alternatives result in reduced VMT in the project area relative to the no build alternative, FHWA is confident that MSAT emissions will also be lower in the project area under those alternatives. Because MSAT emissions on a per VMT basis are expected to decline

due to EPA's control program, and because each of the build alternatives would result in a nearly equal reduction in VMT relative to the no build alternative, FHWA does not believe that there will be significant adverse impacts on the human environment. Under all of the alternatives there is a potential for localized increases in MSAT emissions in areas where new sections of roadway would be built, which potentially could result in increased impacts to human health and the environment. It is not currently possible to confirm or quantify this potential effect.

3.6.2.4 Construction Impacts

Construction activities can have a short-term impact on local air quality during periods of site preparation, with Particulate Matter from fugitive dust having the greatest impact. This impact may occur in association with excavation and earth moving, cement, asphalt, aggregate handling, heavy equipment operation, use of haul roads, wind erosion of exposed areas, and material storage piles. The effect of fugitive dust would be temporary and would vary in scale depending on local weather conditions, the degree of construction activity, and the nature of the construction activity.

3.6.3 Mitigation Measures for Air Quality

Best Management Practice (BMP) measures will be implemented, and the contractor will comply with the provisions of state laws governing the maintenance and operations of construction equipment and regulations governing fugitive dust. The emissions that are due to the construction operations for this project will be mitigated by implementation of the following BMP measures. Specific project level measures suggested during construction operations include:

- **Fugitive Dust Emission Control Plan:** During construction of the project, the contractor would maintain a fugitive dust control plan under the State or Utah Fugitive Emissions Program Rule R307-205-5, effective December 1, 2006. Strategies to control fugitive dust under R307-205-5 may include wetting or watering, chemical stabilization, planting vegetative cover, providing synthetic cover, wind breaks, or other equivalent methods or techniques approved by the DAQ.
- **Other Emissions Controls:** The contractor would shut off construction equipment when not in direct use to reduce idling, adhere to burning restrictions, control local source plant operations (e.g., asphalt, cement, and crushing) restrictions, and minimize hauling.

3.7 NOISE

A Noise Analysis was conducted for this project and is included as **Appendix E** (Michael Baker Jr., Inc., 2006b). The Noise Analysis was conducted in accordance with Utah Code 72-6-111 and 112 and UDOT Traffic Noise Abatement Policy 08A2-1 (revised March 8, 2004), which adopts and incorporates the FHWA's Procedures for Abatement of Highway Traffic Noise and Construction Noise (23 CFR 772).

Traffic noise impacts are defined in 23 CFR 772 as "impacts which occur when predicted traffic noise levels approach or exceed the Noise Abatement Criteria, or when the predicted traffic noise levels substantially exceed the existing noise levels." **Table 3.7-1** shows the UDOT Noise Abatement Approach Criteria, which provides subjective descriptors of the noise impact at the various occupied facilities along the proposed project route. A 10 a-weighted decibel (dBA) or greater increase in the noise level over the existing condition is considered to be a substantial increase impact by UDOT.

TABLE 3.7-1: NOISE ABATEMENT APPROACH CRITERIA*

HOURLY A-WEIGHTED SOUND LEVEL - DECIBELS (dBA)			
Activity Category	**L_{eq} (h) dBA***	**L_{10} (h) dBA***	**Description of Land Use Category**
A	55 (exterior)	58 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	65 (exterior)	68 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	70 (exterior)	73 (exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	-	-	Undeveloped lands.
E	50 (interior)	53 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: 23 CFR 772 and UDOT

*Reflects UDOT's approach criteria levels since a noise impact occurs at this level. Either L_{eq}(h) or L_{10}(h) (but not both) may be used on a project.

Note: Tabulated sound levels are threshold values used to define impact and where abatement should be considered. Noise abatement is designed to achieve a substantial noise reduction - not necessarily achieving the noise abatement criteria.

Category B, C, and E receptors were analyzed for this project. Multi-family residences were identified using a single representative receptor but were counted as separate dwelling units. One hundred and thirteen receptors representing all the receptors / dwelling units were modeled in the immediate vicinity of the project corridor. These

included second and third row receptors that may potentially be affected by the proposed improvement. Approximately 41 sites are commercial businesses, and the rest are residential dwelling units consisting of single family homes and mobile homes.

The following sections identify sensitive receptors that have sound levels that approach, equal, or exceed the UDOT criteria in the existing year, as well as for the No Build and Build Alternatives using the design year (2030) noise environments. **Appendix E** (specifically, Figure 2 and Appendix A of the Noise Analysis) identifies the location of each receptor and sound levels for the existing year (2005) and design year (2030) noise environments. Please note that these sound levels have been rounded.

3.7.1 Existing Noise Environment

There is one receptor (#37) that has sound levels that approach, equal, or exceed the UDOT criteria in the existing year. This receptor is a combined single-family residence and business. The more conservative criteria (Category B) were used to evaluate this site.

3.7.2 No Build Alternative

Thirteen receptors have sound levels that approach, equal, or exceed the UDOT criteria in the design year under the No Build Alternative. These include the same receptor listed in the existing year and other single family residences (receptors #20, 34-41, 73, 82, 93, and 95). On average, the increase over the existing condition is about 2 dBA (1-3 dBA range).

3.7.3 Build Alternative

Eight receptors have sound levels that approach, equal, or exceed the UDOT criteria in the design year with the Build Alternative. These are all single family residences (receptors #20, 34-36, and 38-41). These are the same receptors listed under the No Build Alternative, less receptors potentially acquired as part of the project. The average sound level change is approximately 1-2 dBA (0-4 dBA range) over the No Build Alternative and approximately 3-4 dBA (2-5 dBA range) over the existing year. These sound level changes are primarily the result of a combination of the following variables: minor alignment centerline shifts closer or farther away from noise sensitive sites, the addition of through lane capacity, existing shielding, and the added reflective surface (e.g., additional lane, center lane, and shoulders).

Table 3.7-2 provides a summary of sites that have sound levels that approach, equal, or exceed the NAC. **Table 3.7-3** compares each of the receptor sites that approach, equal, or exceed the NAC in the Existing, No Build, or Build condition. The locations of these sites

are depicted on **Figure 3-7**. Further information about all receptor sites is available in the Noise Analysis (included as **Appendix E)**.

TABLE 3.7-2: TOTAL NUMBER OF RECEPTORS THAT APPROACH, EQUAL, OR EXCEED THE NAC

	Total Numbers by Alternative		
NAC Category	**Existing Year 2005**	**Design Year 2030 No Build**	**Design Year 2030 Build**
B	1	13	8
C	0	0	0
E	0	0	0
Total	1	13	8

Source: Michael Baker Jr., Inc., 2006b

Note: FHWA / UDOT NAC impacts only. There are no predicted UDOT substantial increase criteria impacts. The Build Alternative does not reflect receptors potentially displaced by the project.

TABLE 3.7-3: PREDICTED EXTERIOR SOUND LEVELS (DBA) FOR RECEPTORS THAT APPROACH, EQUAL, OR EXCEED THE NAC

Receptor # and Location	2005 Noise Level	2030 No Build Noise Levels	2030 Build Noise Levels 110' (94')	Reasonable and Feasible Abatement?
20-Residence SB Redwood Road	63	**65**	**65**	No
34-Residence SB Redwood Road	63	**65**	**68**	No
35-Residence SB Redwood Road	63	**65**	**66**	No
36-Residence SB Redwood Road	63	**65**	**66**	No
37-Residence (also Business) SB Redwood Road	**66**	**68**	ROW	ROW
38-Residence SB Redwood Road	64	**66**	**66**	No
39-Residence SB Redwood Road	64	**66**	**66**	No
40-Residence SB Redwood Road	64	**66**	**67**	No
41-Residence SB Redwood Road	64	**66**	**67**	No
73- Residence WB 500 South	63	**66**	ROW	ROW
82-Residence EB 500 South	63	**65**	ROW	ROW
93-Residence EB 500 South	63	**65**	ROW	ROW
95-Residence WB 500 South	64	**65**	ROW (ROW)	ROW

Source: Michael Baker Jr., Inc., 2006b

Note: The location of these receptors is depicted on **Figure 3-7**. Bold text indicates receptors that approach, equal or exceed UDOT's approach criteria. There are no predicted UDOT substantial increase criteria impacts. Sound level values are rounded. A list of all receptors analyzed is included in **Appendix E** (specifically, Appendix A of the Noise Analysis).

ROW = Potential ROW acquisition.

Temporary increases in the sound level environment because of construction activities are expected to occur at the studied receptor sites. Although temporary, there will be occurrences where construction noise is perceptible to the general public. Construction noise levels would not be continuous for any given receptor but would be intermittent and vary by location. For example, a receptor may experience noise due to removal/excavation, drainage installations, and paving operations at different timeframes during the construction. Furthermore, these disruptions could occur while these activities are performed in a northbound direction, and then again for construction in the southbound direction. These individual disruptions should be for a limited period of time.

The sound level changes as a result of the proposed project are not generally significant because the average increases are approximately 1-2 dBA over the No-Build Alternative. The reason for the small average sound level difference is primarily because the existing traffic noise source is already in existence. By and large, roadway widening projects that are constructed on the same relative alignment do not generally have conspicuous sound level changes. Typically, regardless of existing traffic noise level environment is, a person first begins to detect a perceptible difference in that environment when there is a change of at least 3 dBA (±). A 1-2 dBA change is not readily detectable to a normal person.

Please also note that there is a predicted average increase of 3-4 dBA over the existing condition. However, that relative increase is over 25 years, from 2005 to 2030. UDOT Traffic Noise Abatement Policy 08A2-1 (revised March 8, 2004) states that a relative increase between the existing year and design year build conditions must be at least 10 decibels to be considered an impact, as the 10 dBA increase represents a doubling of the sound level environment to the average person.

3.7.4 Mitigation Measures for Traffic Noise

In accordance with UDOT Traffic Noise Abatement Policy 08A2-1 (revised March 8, 2004) and Utah Administrative Code Rule R930-3, Highway Noise Abatement, there are no practical (reasonable and/or feasible) noise abatement measures which will eliminate the traffic noise impact and noise walls are not proposed. **Appendix E** (specifically, Section 11 of the Noise Analysis) provides further detail regarding each specific abatement measure considered.

Generally, the control, timing, and phasing of construction noise will be governed by UDOT construction specifications. The project falls within a "noise sensitive zone" (the land enclosed within a 1,500-foot radius circle of any receptor) as defined by UDOT Construction Standard Specification Section 01355 (Environmental Protection) Part 1.8 Noise and Vibration Control. This specification states that the contractor will be required

to prohibit construction activity in a noise sensitive zone if the sound level within 10 feet of the nearest receptor exceeds 95 dBA in daytime (from 7 am to 9 pm) or 55 dBA in nighttime (from 9 pm to 7 am), as well as Sundays and State Holidays.

For non-planned or non-permitted undeveloped land, it is suggested that commercial development be proposed in future land use zoning to create a buffer zone between SR-68 and sensitive areas and that proposed residential subdivisions be placed farther from the road to avoid potential sound level matters. In an effort to help create a buffer zone for future planning purposes of undeveloped land, the worst-case 65 and 70 dBA contours for the Build Alternative were developed, as discussed in **Appendix E** (specifically, Section 11 and Table 4 of the Noise Analysis).

3.8 WATER RESOURCES

This section describes the current regulatory context, water resources, existing water quality, and project-related impacts. Water quality management and mitigation measures that pertain to the project are also addressed. Water resources include surface water bodies such as lakes, ponds, rivers, streams, canals, and ditches, as well as groundwater bodies such as wells and aquifers. Floodplains are discussed in **Section 3.9** and wetland areas are discussed in **Section 3.10**.

Project relevant policies and permitting requirements of the following agencies were reviewed: United States Army Corps of Engineers (USACE), EPA, Division of Water Quality (DWQ), Division of Drinking Water (DDW), Division of Water Rights, Davis County, Woods Cross, and West Bountiful. Data for this analysis were obtained from these agencies, as well as the Utah Geological Survey (UGS), Utah State University and the Geological Society of America (GSA).

The federal Clean Water Act (CWA) governs most aspects of water quality. Section 401 of the CWA requires a water quality certification that is issued by the DWQ when a project requires a federal license or permit and will result in a discharge to waters of the United States.

Under Section 402 of the CWA, a National Pollutant Discharge Elimination System (NPDES) permit for point discharge and stormwater is required if a proposed project disturbs more than a specific acreage. The DWQ implements Section 402 by requiring a Utah Pollutant Discharge Elimination System (UPDES) Stormwater General Permit for construction activities that disturb more than one acre of land, or whenever the project is part of a larger plan. A UPDES Construction Permit is also required for the development or expansion of a stormwater system that has an increased discharge of five cubic feet per

second (cfs) or more or a new discharge point into Utah waters or waters of the United States.

The USACE administers Section 404 of the CWA. Under Section 404, a permit is required for the discharge of dredged or fill material into waters of the United States.

The Division of Water Rights, also known as the State Engineer's office, administers a Stream Alteration Program that requires individual planning activities affecting a natural stream to obtain a Stream Alteration Permit. Most proposals are covered by a joint permit allowed under General Permit 40, which authorizes the state to have its Stream Alteration Permit also fulfill the requirements of Section 404 of the CWA. In some instances, however, a USACE individual permit is required.

The federal Safe Drinking Water Act Amendments of 1996 require states to establish Source Water Assessment programs for sources of drinking water. Utah has had a mandatory Drinking Water Source Protection (DWSP) program for groundwater sources (e.g., wells and springs) since 1993. In 1998 and 1999, the Utah Source Water Assessment Program (SWAP) supplemented the existing DWSP groundwater program with additional information regarding assessment and protection of surface water sources (e.g., lakes, reservoirs, and rivers). Some Utah counties and municipalities have developed ordinances addressing source protection; however, no such ordinances exist for Davis County, West Bountiful, Woods Cross, or North Salt Lake (DDW, 2006a).

Utah's rules regarding the protection of groundwater sources require that each public drinking water supplier prepare a protection plan that is reviewed and approved by the DDW. The protection plan determines which areas or zones must be protected and the extent of protection that is necessary. Various activities or facilities within these protection zones may be restricted if they would jeopardize the purity of the drinking water source.

Davis County requires a Flood Control Permit for work within 100 feet of the centerline of a stream to certify that plans and specifications meet the Davis County Flood Control Master Plan requirements. The Flood Control Office must also be advised one full working day in advance of the start of each phase of work for inspection purposes.

3.8.1 Surface Waters

As shown in **Figure 3-8**, the project is located where the Jordan Watershed, the Lower Weber Watershed, and the Great Salt Lake meet (USDA, 2006). Major water bodies in these basins are the Great Salt Lake, the Jordan River, and the Weber River. None of these

major water bodies are located within the project corridor. The project corridor is in an urban area located approximately 1.5 miles east of the Great Salt Lake's Farmington Bay.

The Great Salt Lake, a saline remnant of Lake Bonneville, is the only natural lake in the area and surface waters in the project corridor eventually drain toward the lake. The Great Salt Lake is a shallow body of water that covers some 1,700 square miles at a maximum depth of approximately 35 feet. The lake's elevation is approximately 4,200 feet, and its size and depth vary greatly with the rates of evaporation and precipitation. The salinity of the lake also rises and falls inversely with the level of the lake, from five to more than 25 percent. The lake is home to brine shrimp, brine flies, a dozen species of bacteria, two species of protozoa, and a variety of aquatic insects. The lake is also one of the largest migratory bird attractions in Western North America. No fish species live in the lake (USGS, 2006b). Modification of water quantity or quality entering the lake could affect wildlife habitat in the lake and adjacent wetlands.

The Jordan Watershed is managed by the DWQ as part of the Jordan River/Utah Lake Management Unit. The Jordan River flows from Utah Lake and terminates at Farmington Bay. Each of the Jordan River's major tributaries originates in the Wasatch Mountains and flow westward. None of the surface waters located within the project corridor flow into the Jordan River.

The Lower Weber Watershed is managed by the DWQ as part of the Weber River Management Unit. The Weber River and its major tributaries originate at the western end of the Uinta Mountain Range and eventually flow into the Great Salt Lake. Although parts of West Bountiful and Woods Cross are technically considered part of the Lower Weber Watershed, the cities are in a sub-basin composed of flat expanses of fertile lakebed - alluvial deposits from ancient Lake Bonneville (DWQ, 2005). The streams in this sub-basin originate in the Wasatch Mountains and are hydrologically separated from the Weber River drainage by the Wasatch Mountain Range. Water entering into this sub-basin either leaves via evapotranspiration or drains into the Great Salt Lake through streams, wetlands, canals, and/or ditches.

Water bodies within the project survey area (as illustrated in **Figure 3-9)** are Mill Creek, the A1 and A1-A drains, ponds associated with artesian wells, and a series of roadside ditches. Wetland areas also exist within the project survey area (see **Section 3.10**).

Mill Creek and its stilling basin are considered waters of the United States. The creek flows west from the Wasatch Mountains across Bountiful, under I-15, and into a stilling basin before turning north at 700 West and flowing under 500 South in West Bountiful. It crosses under 500 South in a complex 550-foot long, double-barrel concrete box culvert.

Both culverts begin at the concrete lined stilling basin located on the south side of 500 South just west of I-15. The boxes split directions, an eight-foot by four-foot box runs under the south side of 500 South and angles north at 700 West, and a 10-foot by four-foot box runs under 500 South and turns west on the north side of 500 South, paralleling the first box. These two boxes rejoin 200 feet north of 500 South at 700 West where the creek continues in a concrete-lined canal that eventually flows into the Great Salt Lake. The concrete-lined canal and stilling basin are owned and maintained by Davis County. No streamflow data is available for Mill Creek after 1968, but historical averages are shown in **Table 3.8-1**.

TABLE 3.8-1: MONTHLY MEAN STREAMFLOW AVERAGES FOR MILL CREEK (IN CFS)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1.5	1.8	3.2	13	28	18	5.2	2.2	1.4	1.4	1.5	1.6

Source: USGS, 2006a
Note: Historical discharge in cfs at Gauging Station #101450000 - Mill Creek at Mueller Park, Bountiful, Utah. Calculation period from May 1, 1950 to Sept. 30, 1968. No data available for this gauging station post 1968.

The A1 and A1-A drains are managed by the United States Department of the Interior (USDOI) and considered waters of the United States. The purpose of the A1 and A1-A drains are to drain adjacent agricultural fields. The A1 and A1-A drains generally flow from south to north and the channel is approximately eight feet deep, six to eight-feet wide, and trapezoidal in shape. The A1-A drain crosses 500 South in a corrugated metal pipe culvert at approximately 1500 West. The A1 drain crosses Redwood Road in a corrugated metal pipe culvert at approximately 1900 South. The channels run between property lines and fields and eventually make their way to the Great Salt Lake. Unauthorized urban use of these drains is limiting the ability to properly drain agricultural fields (H.W. Lochner, 2005).

There are two artesian wells that occur within the project corridor. Artesian Well A is located at approximately 1200 West along 500 South. Two pipes stick out of the ground approximately 24 inches and are equipped with shut-off valves. The pipes have a continuous flow that keeps an adjacent excavated and bermed pond full. Water from the pond evaporates, is consumed by livestock, or overflows to roadside ditches and then to the A1-A Drain. Artesian Well B occurs immediately to the east of the Auto Auction. A well casing sticks out of the ground approximately 12 inches. A single pipe with a shutoff valve extends from the casing. An adjacent rectangular pond is fed by the well. Water is either consumed by livestock or evaporates, no other outlet is apparent. Since both wells are equipped with shut off valves, the USACE does not have jurisdiction over these wells.

The ditches within the project corridor are typically depressional areas that parallel the roadway. A total of 11,571 feet of roadside ditches and 1,796 feet of pipe connecting the ditches were identified during on-site investigations. As shown in **Figure 3-9**, most of the ditches along 500 South and also those on Redwood Road north of the A1 Drain collect runoff from the road and route it to other ditches or irrigation facilities that flow into either the A1 or A1-A Drain and eventually into the Great Salt Lake. Many of the ditches along the east side of Redwood Road and south of the A1 Drain are connected to Wetland Area 1 (described in **Section 3.10**). In some instances, ditches have become overgrown or filled in to the point where water does not drain properly and wetland characteristics have appeared over time.

The storm drain system along 500 South is within the cities of Woods Cross and West Bountiful. On the north side of 500 South the storm drain system consists of open ditches, reinforced concrete pipes, and corrugated metal pipes. Pipe sizes range from 18 to 48 inches. At 1100 West this system flows from a 48-inch pipe into an open ditch which drains into the A1-A Drain. On the south side of 500 South, the storm drain system consists of a series of open ditches and 18-inch concrete pipes, which also drains into the A1-A Drain. The existing storm drain system along Redwood Road is within the cities of Woods Cross and North Salt Lake. This system consists mostly of roadside swales and open ditches; however, there are a few cross drain pipes contributing to the storm drain system (H.W. Lochner, 2005). New storm drain systems are also being installed as part of new development projects along Redwood Road.

3.8.2 Groundwater

Principal groundwater aquifers are contained within the unconsolidated quaternary basin-fill aquifer. Basin-fill aquifers in Davis and Weber Counties west of the Wasatch Mountain Range are part of the East Shore Aquifer system. This system is part of the Lake Bonneville Basin that is hydrologically closed and has been a source of internal drainage for the past 15 million years. Thick sediment deposits have accumulated since early Tertiary time, reaching 10,000 feet in some areas (UGS, 2004). The East Shore Aquifer System can be divided into two separate hydrologic areas - the Weber Delta area and the Bountiful area. The project corridor exists within the Bountiful area, which has been described as containing shallow, intermediate, and deep artesian aquifers. Although these aquifers are not well delineated, shallow artesian aquifer system wells have completion depths of 60 to 250 feet below ground surface (bgs). Intermediate aquifer wells have completion depths of 250 to 500 feet bgs, and the deep artesian aquifer system wells are completed at 500 feet bgs and greater (DWQ, 2006b). Drinking water is obtained from the deep aquifer (USGS, 2002).

Precipitation is the source of recharge in the East Shore Aquifer System. Recharge enters primarily via subsurface inflow from bedrock in the Wasatch Mountain Range, as well as seepage from streams and direct infiltration of precipitation. Groundwater typically flows west from recharge areas near the Wasatch Mountain Range toward the Great Salt Lake. Primary sources of discharge include flow into the Great Salt Lake, water-well withdrawal, evapotranspiration of shallow groundwater, and flow into small springs and gaining stretches of streams (USGS, 2002). Water-well withdrawal for municipal and industrial use resulted in water level declines of up to 30.8 feet between 1970 and 2000 (Division of Water Resources, 2000).

3.8.3 Current Status of Surface Water Quality

Streams are assessed by the DWQ against state water quality standards and pollution indicators to determine if designated beneficial uses are being met. The quality of water is assessed as "fully supporting" (good to excellent water quality), "partially supporting" (meets the standards most of the time), and "not supporting" (frequently the water quality standards are not met). Pursuant to Section 303(d) of the CWA, stream segments that do not meet water quality standards are considered to be "water quality limited" and are included on the state's 303(d) List of Impaired Waters. Once on the 303(d) List, a total maximum daily load (TMDL) analysis is undertaken to identify the necessary measures and parties responsible for meeting water quality standards. Once a stream segment has a TMDL approved by EPA, it is removed from the 303(d) List of Impaired Waters.

Within the Jordan River/Utah Lake Watershed Management Unit, seven out of eight segments of the Jordan River are included on the 303(d) List. However, none of the surface waters within the project corridor flow into the Jordan River. Within the Lower Weber Watershed there are currently no streams that occur on the 303(d) List. However, no water bodies within this portion of the watershed have been assessed for water quality to see if the beneficial uses are being met (DWQ, 2006a). Mill Creek, within the project corridor, has the following beneficial use classes:

- 1C – Protected for use as a raw water source for domestic water systems;
- 2B – Protected for boating, water skiing, and similar uses, excluding recreational bathing (swimming);
- 3A – Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain; and
- 4 - Protected for agricultural uses, including irrigation of crops and stock watering.

3.8.4 Current Status of Groundwater Quality

Geochemically, groundwater type in the vicinity of the project is sodium bicarbonate and typically contains less than 400 milligrams per liter (mg/L) Total Dissolved Solids (TDS) and is generally considered good quality (USGS, 2002). However, concentrations of volatile organic compounds exceeding EPA standards, especially chlorinated aeromatic hydrocarbons (CAHs) such as tetrachloroethylene (PCE) and trichloroethene (TCE), have been detected in the shallow groundwater and also in tap water in the project vicinity. Several plumes have been exposed. See **Section 3.15** for more information on the plumes and extent of contamination. Two municipal drinking water wells contaminated by CAHs (Woods Cross #1 (06021-WS001) and #2 (06021-WS002) were taken off-line in 1999. Woods Cross #1 is still inactive and Woods Cross #2 has been reactivated (Jensen, October 23, 2006). In addition to CAHs, methyl tertiary butyl ether (MTBE) was detected in the groundwater in the Woods Cross/West Bountiful area as well (EPA, 2004).

3.8.5 Existing Water Rights

Existing water rights are shown in **Figure 3-10**. DDW records indicate that 10 public drinking water wells exist within a mile of the project, as outlined in **Table 3.8-2**. Particularly noteworthy is a well owned by Weber Basin Water Conservancy (06013-11) located on the southeast corner of 500 South and 1100 West. This well is within 100 feet of the project construction limits. The well is not currently in use, but may be in the future (Jensen, August 30, 2006).

TABLE 3.8-2: PUBLIC DRINKING WATER SUPPLY

Number	System Name	Owner	Status	Water Rights
06013-03	Weber Basin South	Weber Basin Water Conservancy	In Use	31-2396
06013-11	Weber Basin South	Weber Basin Water Conservancy	Not Used	-
06019-01	North Salt Lake	North Salt Lake	In Use	31-1577
06019-02	North Salt Lake	North Salt Lake	In Use	31-1577
06019-03	North Salt Lake	North Salt Lake	In Use	-
06019-08	North Salt Lake	North Salt Lake	In Use	-
06021-04	Woods Cross Water System	Woods Cross	In Use	31-4569
06021-05	Woods Cross Water System	Woods Cross	In Use	31-3971
06022-01	Holly Refining & Marketing	Phillips Petroleum Co.	In Use	-
06022-02	Holly Refining & Marketing	Phillips Petroleum Co.	In Use	-

Source: DDW, 2006b

Source protection zones applicable to the project corridor are shown in **Figure 3-10**. These zones identify the surface and subsurface area surrounding a well through which contamination would likely move toward and pollute the source if a contaminant source were present. They also represent the time before contaminants would likely reach the well. In the case of highway operations, potential contaminants of concern would include: roadway salting applications, the use of pesticides and herbicides, oil and grease droppings from vehicles, and hazardous materials spills from accidents.

The operational status and DWSP documentation for the 10 identified public wells indicates the following:

- **Protection Zone 1 (within 100 feet of well) -** Every source well has a 100-foot buffer called Source Protection Zone 1 that is not disclosed in **Figure 3.10**, for security reasons. The Weber Basin South Well (06013-11), owned by Weber Basin Water Conservancy, is within 100 feet of the project construction limits near the intersection of 500 South and 1100 West. This well is currently not in use but may resume operation in the future (Jensen, August 30, 2006). The well meets drinking water standards, but it has historically been used for irrigation purposes.
- **Protection Zone 2 (250-day travel time) -** Two wells (06013-11 and 06022-02) have a protection Zone 2 that overlaps the project corridor. Bacterial and chemical contamination is the primary concern in this protection zone (Jensen, August 28, 2006).

- **Protection Zone 3 (three-year travel time) -** Two wells (06013-11 and 06022-02) have a protection Zone 3 that overlaps the project corridor. Chemical contamination is the primary concern. Zone 3 uses a three-year time-of-travel because use and susceptibility waivers must be renewed every three years.
- **Protection Zone 4 (15-year travel time) -** Five wells (06013-03, 06013-11, 06021-04, 06021-05, and 06022-02) have a protection Zone 4 delineation that overlaps the project corridor. Chemical contamination is the primary concern in this zone (Jensen, August 28, 2006).

Private groundwater rights are highly developed in the East Shore Area, with an average withdrawal of approximately 60,000 acre-feet per year (DWQ, 2001). There are approximately 920 private wells located within a two-mile radius of the project corridor that are used by private residences, agricultural, or industry. Approximately 53 of these wells have annual water rights greater than 1.0 cfs (724 acre-feet). There are several different use classifications that can be assigned to a given well. The use classification for each of these wells is presented in **Table 3.8-3**. Some wells have multiple uses. The largest use of private wells is irrigation. The next largest use is domestic (culinary) and then stock watering wells. The "other" classification includes dairy, fish culture, industrial, dust control, commercial, and mining uses, among others. Government installations are included in the municipal classification even though they may not provide a public drinking water supply.

TABLE 3.8-3: WELLS WITHIN TWO MILES OF THE PROJECT

Use Classification	Number of Wells
Irrigation	694
Domestic	385
Stock Watering	359
Other	127
Municipal	86

Source: Division of Water Rights, 2006

According to the Division of Water Rights records, seven parties own surface water rights within 0.5 miles of the project, including the city of Bountiful, individual property owners, and private industry, as shown in **Table 3.8-4**. The water is primarily used for industry, stock watering, and mining. Mill Creek is essentially the only surface water available for diversion in the area. Eleven points of diversion exist along Mill Creek, the closest of which is 0.9 miles down stream from the project. One party also has surface water rights on an unnamed drain on the west side of 1100 West near Mill Creek in West Bountiful.

TABLE 3.8-4: SURFACE WATER POINTS OF DIVERSION WITHIN 0.5 MILES OF THE PROJECT

Owner	Well Rights Number	Uses	CFS	Source
Security Investment Company	31-1655	IS	2.000	Mill Creek
Orson H. Ellis	31-1786	IS	2.500	Mill Creek
Orson H. Ellis	31-1788	IS	2.500	Mill Creek
Maurice M. and Bernice K. Arbuckle	31-1790	IS	0.230	Mill Creek
Eli R. and Dixie B. Mitchell	31-1791	IS	1.000	Mill Creek
Eli R. and Dixie B. Mitchell	31-1792	IS	1.000	Mill Creek
Bountiful City	31-237	M	41.500	Mill Creek
Rex L. George	31-2802	IS	0.045	Unnamed Drain
Rex L. George	31-2804	IS	0.045	Unnamed Drain
Rex L. George	31-2805	IS	2.000	Mill Creek
Bountiful City	31-341	ISM	7.204	Mill Creek
Alfred T. and Ruth M. Mitchell	31-4855	I	1.000	Mill Creek
Alfred T. and Ruth M. Mitchell	31-4856	I	1.000	Mill Creek

Source: Division of Water Rights, 2006

I = Irrigation; S = Stockwatering; M = Mining

Note: All rights listed in this table are permanent. No new applications for water rights exist. This table does not list revoked, abandoned, or temporary water rights as approved through 2007.

3.8.6 No Build Alternative

The No Build Alternative would not result in new direct SR-68 impacts to water resources. However, given the industrial nature of this community, spill prevention related to traffic accidents is a primary concern. The No Build Alternative would not improve the roadway to meet design standards and is not likely to realize the implementation of BMPs or stormwater improvements that address unchecked contamination associated with roadway runoff.

Projected traffic increases along the project corridor will tax the existing infrastructure, thus creating an environment where traffic accidents and highway spills may be more likely to impact surface waters.

3.8.7 Build Alternative

To assist with the water quality analysis, the project corridor was divided into eight discharge areas based on roadway high and low points. Peak flow rates increase in every drainage area as a result of the project. However, times of concentration decrease in all

areas, except at 1100 South. Despite increased flow rates, there is no increase in stormwater discharge as a result of the project because detention basins are planned for each drainage area and sized as necessary to hold increased peak runoff volume associated with either the 10 year or 100 year event (whichever results the greatest volume). As such, outflow from detention ponds would be released at the historic rate. Drainage would be conveyed to existing or future city/county systems or through ditches and pipes to nearby surface waters as shown in **Table 3.8-5**.

TABLE 3.8-5: DRAINAGE AREAS ALONG PROJECT CORRIDOR

Drainage Area	Detention Basin Location	10-year Storm Flow Increase[1] (cfs)	100-year Storm Flow Increase[1] (cfs)	Required Detention Volume[2] (Ac-ft)	Outflow
1	2600 South	1.10	1.54	0.02	Existing North Salt Lake storm drain
2	2425 South	4.97	9.60	0.17	Existing Woods Cross storm drain
3	A1 Drain	1.33	2.48	0.12	A1 Drain
4	1500 South	1.53	2.85	0.14	Irrigation Ditch to A1 Drain
5	1180 South	1.49	2.88	0.05	Irrigation Ditch to A1 Drain
6	SE corner of Redwood and 500 South	3.95	8.19	0.39	Storm drain pipe follows ditch running north to 400 South, then west (piped over A1 Drain) and eventually to the Great Salt Lake
7	SE corner of Redwood and 500 South	4.55	9.10	0.18	Storm drain pipe follows ditch running north to 400 South, then west (piped over A1 Drain) and eventually to the Great Salt Lake
8	A1-A Drain	9.78	18.65	0.44	A1-A Drain

[1] Calculated using a 15-minute storm to show the difference in flow rate between existing and developed condition.
[2] The required detention volume is based on conceptual design and determined from the largest calculated difference between existing and developed stormwater runoff rates of various storm durations.

Roadway construction may result in short-term direct impacts on Mill Creek and drainage ditches in the form of temporary increases of sediment levels and pollutants associated with roadway runoff and construction activities. Possible pollutants include nutrients, bacteria, lubricants, heavy metals from parts wear, trash, sediment, petroleum hydrocarbons, and synthetic organics. Material and waste stored on site could enter surface waters as debris. Leakage of fuel or oil from machinery could load hydrocarbons into waterways directly or through overland flow or storm drains. Concrete work along the banks could induce a temporary but localized caustic environment in the waterway. Disturbance of contaminated soils could convey pollutants to surface waters.

Potential long-term or permanent impacts from the project mainly consist of additional runoff and pollutants associated with increased impervious surfaces and landscaped areas. Landscaping materials and chemicals (herbicides, mulches, soil additives) could wash into surface waters if not applied or stored properly.

Under the Build Alternative, the impervious surface area of the highway is estimated to increase by up to 26 acres, an increase of 164 percent over existing conditions. As impervious surface areas increase from highway widening, and curbs and gutters are installed, the road surface conveys the drainage water more rapidly and in a concentrated manner across the road, thus potentially increasing peak runoff flows. These conditions can lead to difficulties with storm drainage control, stream channel maintenance, and stream-water quality if not property controlled. Additionally, the increased storm runoff may not be available to recharge the groundwater. The eight detention basins that are planned to alleviate potential impacts associated with stormwater runoff are depicted in **Figure 2-5.**

With the Build Alternative, the existing storm drainage system within the project corridor would be replaced and new storm drains installed where none exist, including where the new roadway would displace roadside ditches. At the intersection of 500 South and Redwood Road, improvements would tie into improvements being made as part of the Legacy Parkway project. Legacy Parkway plans to install a pipe that runs in a northwesterly direction from the southeast quadrant of the new intersection under 500 South and Redwood Road to the ditch located to the north. The Build Alternative would build a detention basin on the southeast quadrant of this intersection and discharge from this basin would go into this new pipe.

Construction associated with Mill Creek would be phased and flow diverted as necessary to limit impacts on downstream water rights. Applicable BMPs would be in place as necessary to ensure water quality for downstream users. Construction activities associated with the A1 and A1-A drains would be completed when the channels are dry.

Without proper controls, excavation activities could threaten surface and groundwater resources. Excavation and trenching may require temporary dewatering of the shallow unconsolidated groundwater table, but this water would be recharged on site and groundwater depletion from dewatering would not impact water rights. Other potential impacts to shallow groundwater could result from spills of materials stored on site, or leakage of fuel or lubricants from heavy equipment. Detention basins and other BMPs will help to filter out contaminants associated with the roadway before stormwater runoff reaches groundwater.

3.8.8 Mitigation Measures for Water Resources

Mitigation for impacts to water resources is addressed through several required permits and approvals. **Table 3.8-6** provides a summary of the permits and approvals that will be obtained prior to implementation of the project. Mitigation requirements and other conditions associated with these permits and approvals will be complied with.

TABLE 3.8-6: REQUIRED PERMITS AND APPROVALS PERTAINING TO WATER RESOURCES

Permit / Approval Required	Associated Activity	Permitting / Approval Agency
Section 401 Water Quality Certification	Discharge to waters of the United States.	DWQ
Section 402 UPDES Stormwater General Permit	Control of pollutants associated with stormwater discharges from construction activities that disturb more than one acre of land.	DWQ. A Stormwater Pollution Prevention Plan (SWPPP) and Temporary Erosion and Sediment Control Plan and Notice of Intent (NOI) are required for this permit.
Section 402 UPDES Construction Permit	Development or expansion of a stormwater system that has an increased discharge of five cfs or more or a new discharge point.	DWQ
Section 404 Permit	Discharge of dredged or fill material into waters of the United States, including wetlands.	USACE. The USACE has concurred with the wetland delineation and identification of the waters of the United States (see letter dated August 30, 2006 in **Appendix A**).
Stream Alteration Permit	Work associated with Mill Creek and the A1 and A1-A Drain.	Division of Water Rights (State Engineer's Office).
Water Rights Permit	Appropriation and distribution of water (if additional water rights are needed for construction).	DDW
Flood Control Permit	Work within 100 feet of Mill Creek and the A1 or A1-A Drain.	Davis County
Approval	Discharge to existing stormwater system.	Davis County, Woods Cross, West Bountiful, and North Salt Lake.
Review	Construction within a wellhead protection zone.	DDW

The permitting process together with BMPs, as required under Section 402 of the CWA, provide a coordinated and comprehensive effort to mitigate for short-term (construction-related) and long-term impacts on receiving waters. BMPs are "schedules of activities, prohibitions of practices, maintenance procedures and other management practices to prevent or reduce the pollution of waters of the United States" (40 CFR 122.2). They include, but are not limited to, "treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage" (40 CFR 122.2). An erosion control plan including the use of BMPs to control construction-related erosion and sedimentation impacts will be developed and incorporated in the design plans. This plan will be reviewed by agencies as part of the permitting requirements and included in the construction contract documents. The Spill Prevention, Control, and Countermeasure (SPCC) plan will ensure that the risk of contamination to the site is minimized. During construction, the effectiveness of BMPs will be monitored. Public drinking water well owners would be notified prior to construction taking place within source protection zones.

3.9 FLOODPLAINS

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP). This program was established in accordance with the National Flood Insurance Act of 1968, as modified by the Flood Disaster Protection Act of 1973 and the National Flood Insurance Reform Act of 1994. Woods Cross, West Bountiful, and North Salt Lake participate in the regular phase of FEMA's NFIP and the Flood Insurance Rate Maps (FIRM) for these cities are shown in **Figure 3.11**. The FIRM identifies base flood elevations, insurance risk zones, floodplain boundaries (e.g., 100-year), and floodway boundaries. The current and beneficial value of the existing floodplain is to convey runoff from storm events. The project would not encroach on the 100-year floodplain associated with Mill Creek. The widened roadway would be designed so that it would not increase the base flood elevation of the floodplain associated with Mill Creek.

3.10 WETLANDS

Executive Order 11990 (1997) requires federal agencies to take action to minimize the loss of wetlands. The NEPA compliance process requires federal agencies to consider direct and indirect impacts to wetlands that may result from federally funded actions. The placement of fill or dredge material in waters of the United States, including wetland areas, is regulated by the USACE under Section 404 of the CWA (42 CFR 7401 et seq.). This section discusses wetland areas. Other surface waters within the project survey area

include Mill Creek and its stilling basin, the A1 and A1-A drains, ponds associated with two artesian wells, and a series of roadside ditches, as discussed in **Section 3.8.1**.

3.10.1 Wetland Areas

Wetland areas within the project survey area were delineated during field investigations conducted in 2005 and 2006 using methods described in the USACE Wetland Delineation Manual (1987). Wetland areas were identified using the definition of 33 CFR 328.3(b) that requires the presence of hydrophytic vegetation, hydric soils, and wetland hydrology. One wetland (Wetland Area 2) had been filled in by development prior to the field review held with the USACE on April 25, 2006. **Figure 3-9** illustrates the location of the two remaining delineated wetland areas, totaling 0.94 acres. The USACE has jurisdiction over these two wetland areas. In general, springs, surface water, groundwater, direct precipitation, or a combination of these sources provides a source of water for wetlands within the project survey area. The following paragraphs provide additional details concerning the two remaining wetlands evaluated during the wetland investigation activities.

- **Wetland Area 1:** This wetland is located on the corner of 2600 South and Redwood Road on the east side. It is a portion of a heavily grazed agricultural field that extends past the survey area to the east. A cracked mud surface from seasonal ponding/flooding was present at the time of survey. Historically, the primary source of water was shallow groundwater and a natural spring near the eastern boundary of the site outside of the survey area. Ditches along the southern and western edges of the wetland area have appeared to lower the water table. Dominant vegetation consists of Rush (*Juncus sp.*), Salt grass (*Distichlis spicata*) and Foxtail (*Hordeum jubatum*). The wetland is a result of natural causes and provides suitable habitat for a variety of wildlife species.
- **Wetland Area 3:** This wetland is a triangle-shaped depressional area at the northwest corner of the survey area. It is bounded on all sides by roads, SR-68 on the southeast, a dirt road to the north, and a dirt road on the west side (where the proposed Legacy Parkway will connect with SR-68). There are ditches on the north and west sides that run into the A1-A Drain and eventually into the Great Salt Lake. This area is depressed from the roadway and it appears that it ponds or floods. Dominant vegetation consists of Salt grass (*Distichlis spicata*), Wheatgrass (*Agropyron smithii*), and Common reed (*Phragmites australis*). The wetland is a result of a combination of natural and unnatural causes, provides some water storage, and little wildlife habitat. The entire 0.33 acres of wetland would be permanently impacted by the

construction of intersection improvements at 500 South and Redwood Road for the Legacy Parkway. Since the Legacy Parkway is scheduled for completion prior to this project, mitigation for the loss of this entire site will be completed as part of the Legacy Parkway project and this site is not discussed further in this analysis.

3.10.2 Wetland Functions and Values

FHWA Technical Advisory T 6640.8A (1987) recommends that when evaluating the impact of a proposed project on wetlands, the importance of the impacted wetland(s) must be evaluated. The guidance also states that in evaluating the importance of the wetlands, the analysis should consider factors such as: (1) the primary function of the wetlands (e.g., flood control, wildlife habitat, and groundwater recharge); (2) the relative importance of these functions to the total wetland resource of the area; and (3) other factors, such as uniqueness, which may contribute to the wetland importance (FHWA, 1987). As suggested by this FHWA guidance, in order to determine the relative importance of wetlands associated with a project, the "functions" of the wetlands must first be examined and understood.

Wetland functions consist of the physical, chemical, and biological interactions within a wetland (USDA, 1996). Wetland functions include processes such as surface and subsurface water storage, nutrient recycling, particulate removal, maintenance of plant and animal communities, water filtration or purification, and groundwater recharge. The function of a given wetland depends on multiple factors, including but not limited to: area extent/size, topographic positioning, hydrologic regime, local geology, and wetland type.

FHWA guidance (1987) recommends evaluating the importance of wetlands based on the primary functions of wetlands. Based on this FHWA guidance, knowledge of the wetlands in the project survey area, and information available from the USACE, NRCS, EPA, and the United States Geological Survey (USGS), wetland functions for purposes of this project were separated into the following categories: water filtration, surface water storage, groundwater recharge, nutrient cycling, sediment retention, and biological production.

The value of a wetland is an estimate of the importance or worth of one or more of its functions (EPA, 2002) or beneficial characteristics (USDA, 1996). Values were determined using the six categories of functions. Although large-scale benefits of functions can be valued monetarily fairly easily, determining the value of individual wetlands is difficult because they differ widely and do not all perform the same functions or perform

functions equally well (EPA, 2002). Given the difficulties associated with assigning a specific value to individual wetland plots, a generalized hierarchical value system was developed for this project as follows:

- **Low Value:** The wetland is dominated by non-native, invasive plant life, is less than 0.1 acres in size, provides minimal water storage and filtering capacity, and provides little to no wildlife habitat. The wetland was unintentionally created by grading, poor maintenance of drainage structures, or other unnatural causes;
- **Moderate Value:** The wetland exhibits a mixture of both non-native and invasive plant life, is less than 0.1 acres in size, provides minimal water storage and filtering capacity, and provides suitable habitat for at least a few wildlife species. The wetland is the result of a combination of natural and unnatural causes; and
- **High Value:** The wetland is dominated by native vegetation, is greater than or equal to 0.1 acres in size, provides substantial water storage and water filtering capacity, and provides suitable habitat for a variety of wildlife species. The wetland occurs naturally with little or no unnatural influences.

Table 3.10-1 summarizes the type, size, function, and values of Wetland Area 1.

TABLE 3.10-1: WETLAND FUNCTIONS AND VALUES SUMMARY

Wetland Area	Type	Functions	Value	Comments
Wetland Area 1 (0.61 acres)	Agricultural Field	Surface Water Storage, Water Filtration, Sediment Retention, Groundwater Recharge, Nutrient Cycling	High	Open Space; Provides Wildlife Habitat; Natural Spring and Shallow Groundwater

3.10.3 No Build Alternative

The No Build Alternative would include on-going roadway maintenance activities that may require dredging or filling of wetlands or other waters of the United States.

3.10.4 Build Alternative

Impacts to Wetland Area 1 are shown in **Table 3.10-2.** The Build Alternative would result in up to 0.06 acres of direct impacts to this wetland, representing the area that would be displaced by fill. Additionally, up to 0.03 acres of this wetland would be temporarily disturbed by construction activities.

TABLE 3.10-2: IMPACTS TO WETLAND AREAS

Wetland	Wetland Type	Wetland Function and Value	Within Project Survey Area	Acres of Impact
Wetland Area 1	Agricultural Field	Surface Water Storage, Water Filtration, Sediment Retention, Groundwater Recharge, Nutrient Cycling High Value	0.61 acres	0.06 (Permanent) 0.03 (Temporary)

Note: Boundary extended beyond the project survey area.

3.10.5 Only Practicable Alternative Finding

Executive Order 11990 directs federal agencies to avoid to the extent possible the long and short term adverse impacts associated with the modification or destruction of wetlands, and to avoid direct and indirect support of construction in wetlands unless there is no practical alternative to such construction and the proposed action includes all practical measures to minimize harm to the wetlands. This section explains why there is no practical alternative to the proposed action and how the proposed action includes all practical measures to minimize harm to wetlands.

A major emphasis of the alternative formulation and screening for the project included wetland avoidance and impact minimization. The results of this process are summarized in Chapter 2 and further detailed in the SR-68, 2600 South to I-15 in davis County Alternative Development Report (H.W. Lochner, 2006, included as **Appendix D**). Wetlands cannot be completely avoided by any alignment within the study area; however, a shift in the alignment was able to minimize impacts to Wetland Area 1. Further avoidance is not possible because of the proximity of this wetland area to the intersection with 2600 South and Redwood Road. The Preferred Alternative, analyzed in this EA as the 110-foot ROW with the 94-foot ROW Option between 800 West and 700 West, is considered to be the least damaging to wetlands. The No Build Alternative is not a practicable alternative because it does not meet the project purpose and need. Specifically, the No Build Alternative does not improve future corridor mobility and accommodate future travel demand through the design year 2030. The No Build Alternative is unable to provide safe and efficient connections to nearby major transportation facilities (transit, freeways, highways, and trail systems) or correct geometric and drainage problems.

The Preferred Alternative would require work in wetlands and includes all practicable measures to minimize harm and mitigating unavoidable impacts. Wetlands not required to construct the project will be avoided, preserved, or protected from damage and/or

degradation during construction. The Preferred Alternative will permanently impact up to 0.06 acres of agricultural field wetlands, representing the area that would be displaced by fill. Up to 0.03 acres of unavoidable temporary impacts are anticipated as a result of construction activities.

Wetlands that are temporarily impacted by equipment or other construction activities will be restored following construction. Project mitigation efforts will be coordinated with and approved by the Army Corps of Engineers. Mitigation requirements and other conditions outlined in the Section 404 Permit will be complied with. Conceptually, mitigation for unavoidable permanent impacts could be developed through additional mitigation efforts within the Legacy Nature Preserve, preservation / mitigation in the Farmington Bay area, or stream restoration /preservation on one of the local watercourses.

Based on the above considerations, it is determined that there is no practicable alternative to the proposed construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use.

3.10.6 Mitigation Measures for Wetlands

An alignment shift has been incorporated into the Build Alternative to minimize impacts to Wetland Area 1. Further avoidance is not possible because of the proximity of this wetland area to the intersection with 2600 South and Redwood Road. A Section 404 Permit will be obtained prior to discharging dredged or fill materials into waters of the United States, including wetlands. Because permanent impacts to wetlands are only 0.06 acres, creation of a wetland area is not expected to be economically feasible. Mitigation opportunities for the project impacts could be developed within one of the following areas:

- Additional mitigation efforts within the Legacy Nature Preserve.
- Preservation / mitigation in the Farmington Bay area.
- Stream restoration or preservation on one of the local watercourses.

Project mitigation efforts will be coordinated and approved by the Army Corps of Engineers. Mitigation requirements and other conditions outlined in the Section 404 Permit will be complied with. Wetlands temporarily impacted by equipment or other construction activities will be restored following construction.

3.11 VEGETATION AND WILDLIFE

3.11.1 Description of Vegetation and Wildlife

Along 500 South, the project corridor consists mainly of landscaped lawns and a few pastures or agricultural fields producing hay or grass. Along Redwood Road, the project corridor consists mainly of pasture or agricultural fields producing hay or grass with a few landscaped lawns. In general, the vegetation along the existing road consists of some combination of the following plants: cheatgrass (*Bromus tectorum*), purple loosestrife (*Lythrum salicaria*), field bindweed (*Convolvulus arvensis*), wheatgrass (*Thinopyron ponticum*), foxtail barley (*Hordeum jubatum*), perennial pepperweed (*Lepidium latifolium*), saltgrass (*Distichlis spicata*), cottonwood (*Populas sp.*), Russian olive (*Elaeagnus angustifolia*), tamarisk (*Tamarix ramosissima*), bluegrass (*Poa pratensis*), tumbleweed (*Salsola iberica*), and teasle (*Dipsacus sylvestris*).

Agricultural practices and commercial, residential, industrial, and transportation developments have influenced the vegetation and wildlife in the project corridor. Wildlife species that are present tend to be tolerant of disturbances and adaptable to smaller areas of undeveloped land. There are no large game migration corridors, where mule deer or elk typically cross the roadway during the fall or spring. Given the limited habitat within the project corridor, the following wildlife species are likely transient in the project corridor, if present at all: starlings, sparrows, black-billed magpie (*Pica pica*), American robin (*Turdus migratorius*), ring-necked pheasant (*Phasianus colchicus*), mourning dove (*Zenaida macroura*), California quail (*Callipepla californi*ca), American kestrel (*Falco sparverius*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), swainson's hawk (*Buteo swainsoni*), striped skunk (*Mephitis mephitis*), northern raccoon (*Procyon lotor*), northern pocket gopher (*Thomomys talpoides*), red fox (*Vulpes vulpes*), cottontail (*sylvilagus nuttallii*), black-tailed jack rabbit (*Lepus californicus*), and various small rodents. No raptor nests were observed during the field visits for this project. Federally listed species, as well as state sensitive species and migratory birds are addressed further in **Section 3.12**.

3.11.2 No Build Alternative

On-going roadway maintenance activities may temporarily disturb vegetation and wildlife. Since BMPs would be used, permanent impacts would not be anticipated under the No Build Alternative.

3.11.3 Build Alternative

Direct impacts on vegetation could result from the removal of vegetation, soil compaction, and increased soil erosion. The Build Alternative would remove up to 26 acres of existing roadside vegetation and .09 acres of vegetation associated with wetland areas. Although roadside vegetation and urban landscaping provide wildlife habitat, changes in these vegetation types are not expected to alter the presence or absence of existing wildlife species. Likewise, the wildlife habitat value of the remaining wetland area is not expected to be altered.

Because of the lack of biodiversity of the vegetation communities within the construction limits, the current degraded habitat functions and values of these communities for wildlife, and the low density of residential wildlife within the project corridor, the impacts to vegetation and wildlife are expected to be minimal. The Division of Wildlife Resources stated that because of the existing conditions of the project corridor and that the project impacts would be adjacent to previously disturbed lands, no substantial negative impacts to wildlife would be anticipated (see letter dated August 31, 2005 in **Appendix A**).

3.11.4 Mitigation Measures for Vegetation and Wildlife

Vegetation temporarily disturbed by the project will be re-established in accordance with UDOT Standard Specification Section 2922 and CSS principles coordinated through the CSC, as discussed in **Section 2.4.2**. No further mitigation is planned for the minimal impacts to wildlife.

3.12 THREATENED, ENDANGERED, AND OTHER SENSITIVE SPECIES

3.12.1 Threatened, Endangered, and Other Sensitive Species

The Endangered Species Act (ESA) of 1973 (16 USC 1531-1543) declares the intention of Congress to protect federally listed threatened and endangered species and designated critical habitat of such species. Section 7 of the ESA requires federal agencies, such as FHWA, to ensure that any action is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of critical habitat. The ESA defines an endangered species as a species that is in danger of becoming extinct throughout all or a significant portion of its range. A threatened species is one that is likely to become endangered in the foreseeable future. The United States Fish and Wildlife Service (USFWS) is the primary regulatory agency responsible for ESA

compliance. Species listed as candidate species are currently being reviewed by the USFWS to determine if they should also be protected under the ESA.

The Utah Department of Natural Resources (UDNR) maintains the Natural Heritage Program database with the known locations of federally listed threatened and endangered species, as well as state sensitive species. The database does not contain any records of occurrence for any threatened, endangered, or sensitive species within the project corridor. However, the Utah Division of Wildlife Resources indicated that state sensitive species, including the American white pelican, ferruginous hawk, kit fox, Lewis's woodpecker, and the short-eared owl are known to occur in the vicinity of the project corridor (see letter dated July 26, 2006 in **Appendix A**).

The project corridor also contains suitable habitat that may provide opportunities for forage, roosts, and nesting to migrating birds, such as raptors and passerines. The Migratory Bird Treaty Act (MBTA) of 1918 provides for the protection of birds classified as migratory by the USFWS. The MBTA prohibits any action or future actions that may harm migratory birds. "Harm" is described such as destroying active nests or roosts, or disturbing or interrupting nesting birds. Specific protection for bald and golden eagles is authorized under the Eagle Protection Act (16 USC 668) which provides additional protection to these species from intentional or unintentional harmful conduct. To establish consistent raptor management, the USFWS developed the "Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances" in January, 2002 (USFWS, 2002). Division of Wildlife's letter dated August 31, 2005 also indicates that there are no bald eagles within a one-mile buffer of the project and no raptor nests were observed during project-related site visits.

3.12.2 No Build and Build Alternative

No federally listed or proposed threatened, endangered, or candidate species, or their critical habitat would be affected by this project (see letter from UDOT dated October 23, 2006 in **Appendix A**). Due to the distance of the state sensitive species from the project corridor and the likelihood of their presence, these species will not be impacted by this project. Migratory birds have the ability to flee from construction and can move to adjacent habitat.

3.12.3 Mitigation Measures for Threatened, Endangered, and Other Sensitive Species

No mitigation is necessary.

3.13 INVASIVE SPECIES

3.13.1 Invasive Species or Noxious Weeds

Executive Order 13112 requires federal agencies to combat the introduction or spread of invasive species. The order defines invasive species as "any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." The Utah Noxious Weed Act, Title 04 Chapter 17 of the Utah Code and Constitution requires each county to formulate and implement a countywide noxious weed control program designed to prevent and control noxious weeds.

The USDA and the Utah State Department of Agriculture and Food (UDAF) are responsible for officially designating noxious weeds. Noxious weeds are invasive species that by federal and state law must be controlled. The UDAF lists 18 species that are officially designated as noxious and each county lists additional species. Several UDAF noxious weed species were identified during field investigations, including field bindweed, perennial pepper weed, and purple loosestrife.

Utah has several species listed as invasive (ISSG, 2006). Invasive species include not only noxious weeds, but also other plants and animals that are not native. Species are considered invasive if they have been introduced into an environment where they did not evolve. As a result, invasive species generally do not have natural predators to limit their reproduction and spread rampantly. Invasive species can produce significant changes to vegetation, composition, structure, or ecosystem function. Invasive species other than noxious weeds that were identified during field investigations include common reed, cheatgrass, tamarisk, and Russian olive.

3.13.2 No Build and Build Alternative

Invasive species or noxious weeds could be introduced or spread via vehicles and soil disturbance activities. This includes on-going roadway maintenance, as well as construction associated with the Build Alternative.

3.13.3 Mitigation Measures for Invasive Species or Noxious Weeds

UDOT's Special Provision Section 0294S: Invasive Weed Control, identifies BMPs that will be used to prevent invasions of noxious weeds on disturbed sites along the ROW. UDOT

will specify on construction contract documents that seed mixes used for landscaping and/or erosion control must be free of noxious weeds and other invasive plant species.

In compliance with the Executive Order 13112, the Utah Noxious Weed Act, and subsequent guidance from FHWA, the landscaping and erosion control included in the project will not use species listed as noxious weeds. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or adjacent to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

3.14 PALEONTOLOGICAL, ARCHAEOLOGICAL, AND HISTORIC RESOURCES

3.14.1 Paleontological, Archaeological, and Historic Resources

The National Historic Preservation Act (NHPA), as amended, sets forth national policy and procedures regarding "historic properties" (i.e., districts, sites, buildings, structures and objects included in or eligible for the National Register of Historic Places (NRHP)). Section 106 of NHPA requires federal agencies to consider the effects of their undertakings on such properties, following regulations issued by the Advisory Council on Historic Preservation (ACHP) (36 CFR 800).

The Area of Potential Effects (APE) was evaluated for cultural resources by SWCA Environmental Consultants (SWCA, 2005 and 2006). No sensitive paleontological resources were discovered during the survey. In addition, the potential for paleontological fossil resources within the APE was extremely low, as per SWCA's consultation with the UGS. A total of 35 historic properties, consisting of 32 historic architectural properties and 3 archaeological sites, were identified within the APE (see correspondence dated October 6, 2006 in **Appendix A** for a list of these properties).

3.14.2 Determination of Eligibility

Of the 32 historic architectural properties identified, 12 are eligible for the National Register of Historic Places (NRHP). All 3 three identified archaeological sites are also eligible for the NRHP. The NRHP-eligibility of each property has been documented in the Determination of Eligibility and Finding of Effect (DOE/FOE) (UDOT, 2006b) included in **Appendix A**. **Figure 3-12** shows the APE and location of the NRHP-eligible historic properties, which are discussed further in **Section 3.14.3**. In accordance with 36 CFR 60.4 sites were evaluated using the four types of association (A, B, C, or D) within a historic context and meet most of the aspects of integrity. In addition, since the architectural resources were documented at a reconnaissance or intensive level, they were

evaluated using a rating system (A, B, C, D) established by the State Historic Preservation Officer (SHPO).

3.14.3 Finding of Effect

Each of the potentially affected NRHP-eligible properties is identified in **Table 3.14-1** and documented in the DOE/FOE (UDOT, 2006b) included in **Appendix A**. Construction of the Build Alternative would have an Adverse Effect on the property located at 772 West 500 South. Construction would require a physical impact and removal of the historic building located on this site. Accordingly, FHWA and UDOT have determined, pursuant to 36 CFR 800.4(d) and 800.5(a-d), that the implementation of the Build Alternative will result in a finding of Adverse Effect.

FHWA and UDOT have determined that No Historic Properties Affected would apply to five historic properties eligible for the NRHP. Two of these properties (1524 West 500 South and the Homestead at Site 42Dv67) would not be impacted by the project because of the distance between these properties and the construction zone. Only temporary physical impacts would occur to a third property located at 2125 South 1800 West. The project would involve only reconstruction and widening of the at-grade crossings and would have no impact on the location setting, feeling, or association of the two linear features (Site 42Dv86 and Site 42Dv87).

Additionally, FHWA and UDOT have determined that the project would result in No Adverse Effect to nine historic properties because of permanent physical impacts to land associated with the historic boundary of these properties; 680 West 500 South, 715 West 500 South, 915 West 500 South, 1057 West 500 South, 836 South 1800 West, 946 South 1800 West, 1650 South 1800 West, 2018-2020 South 1800 West, and 2595 South 1800 West. Section 4(f) considerations are discussed in **Chapter 4**.

TABLE 3.14-1: POTENTIALLY AFFECTED NRHP-ELIGIBLE PROPERTIES

Site	SHPO Rating / NRHP Eligibility	Finding of Effect
Site 42Dv67 – Homestead	Eligible under Criterion D	No Effect
Site 42Dv86 – D&RGW	Entire line eligible under Criterion A	No Effect
Site 42Dv87 – UPRR	Entire line eligible under Criterion A	No Effect
680 West 500 South, West Bountiful (Residence)	B-rated/ Eligible under Criterion C	No Adverse Effect
715 West 500 South, West Bountiful (Warehouse)	B-rated/ Eligible under Criterion C	No Adverse Effect
772 West 500 South, West Bountiful (Residence, former bank building)	**B-rated/ Previously determined Eligible under Criterion C**	**Adverse Effect**
915 West 500 South, West Bountiful (Residence)	A-rated/ Eligible under Criterion C	No Adverse Effect
1057 West 500 South, West Bountiful (Residence, aka 1067)	B-rated/ Eligible under Criterion C	No Adverse Effect
1524 West 500 South, Woods Cross (Residence)	B-rated/ Eligible under Criterion C	No Effect
836 South 1800 West, Woods Cross (Residence, part of Communal Complex)	B-rated/ Eligible under Criterion C	No Adverse Effect
946 South 1800 West, Woods Cross (Residence, part of Communal Complex)	B-rated/ Eligible under Criterion C	No Adverse Effect
1650 South 1800 West, Woods Cross (Residence)	B-rated/ Eligible under Criterion C	No Adverse Effect
2018-2020 South 1800 West, Woods Cross (Residence)	B-rated/ Eligible under Criterion C	No Adverse Effect
2125 South 1800 West, Woods Cross (Warehouse)	B-rated/ Eligible under Criterion C	No Effect
2595 South 1800 West, Woods Cross (Residence)	A-rated/ Eligible under Criterion C	No Adverse Effect

Source: UDOT, 2006b
Note: Bold indicates properties with an Adverse Effect.

3.14.4 Consultation

Appendix A includes consultation letters, as well as the Determination of Eligibility and Finding of Effect (DOE/FOE) (UDOT, 2006b), the Notice of Adverse Effect, and the Memorandum of Agreement (MOA) (UDOT, 2006c).

3.14.5 Mitigation Measures for Cultural Resources

Mitigation will be conducted in accordance with the MOA (included in **Appendix A)**. Pursuant to 36 CFR 800.6, measures that minimize the effects of the project on the historic qualities of the adversely affected property located at 772 West 500 South, West Bountiful, have been developed in consultation with SHPO. UDOT has also solicited the views of interested parties. Proposed mitigation for this property includes:

- Documentation of the historic property to the Utah State Intensive Level Survey (ILS) Standards in advance of construction activity; and
- Off-site project consisting of multiple property context/submission and nominations for the eligible carriage houses in West Bountiful.

The MOA also includes stipulations for planning, discovery, and monitoring; review of implementation and measures for dispute resolution; and provisions specific to the Utah Native American Graves Protection & Repatriation Act (UNAGPRA).

UDOT Standard 01355 Environmental Protection Part 1.10 - Discovery of Historic, Archaeological, and Paleontological Resources, applies to this project and stipulates instructions to the contractor for the protection of any archaeological, historical, or paleontological resource discovered in the course of construction. Should a discovery occur, UDOT would consult with SHPO and relevant Consulting Parties toward developing and implementing an appropriate treatment plan prior to resuming construction.

3.15 HAZARDOUS MATERIALS OR WASTE

3.15.1 Identified Hazardous Materials and Waste Facilities

This section summarizes known hazardous or regulated material sites along the project corridor. These sites have the potential to impact construction of the project depending on the type of facility, distance from the proposed construction, soil types, and surface and groundwater elevation gradients. Hazardous or regulated material sites could increase costs associated with highway improvements and/or present future risk to UDOT as the new property owner. Most importantly, these sites can present risks to human health and ecological receptors exposed to the materials or contaminated media. To identify sites along the project corridor, several independent online searches were conducted through available EPA and State of Utah databases, including:

- EPA's National Priority List (NPL) of confirmed Federal Superfund sites (1.0-mile radius search);

- EPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list of potential Federal Superfund sites (1.0-mile radius search);
- EPA's list of Resource Conservation and Recovery Act (RCRA) hazardous waste generators and Treatment, Storage, and Disposal Facilities (TSDFs) (1.0-mile radius search);
- Utah Department of Environmental Quality (UDEQ), Division of Environmental Response and Remediation's (DERR) inventory of State Hazardous Waste Sites (SHWS) (1.0-mile radius search);
- Utah's list of Underground Storage Tanks (UST) (1.0-mile radius search); and
- Utah's list of Leaking Underground Storage Tanks (LUST) (1.0-mile radius search).

In addition to the online database searches, the Solid Waste Section of the UDEQ, Division of Solid and Hazardous Waste (DSHW) was contacted for information regarding landfills in or near the project corridor.

The EPA's online NPL database indicated that there are two NPL sites within one mile of the project. These are listed as the Bountiful-Woods Cross 500 South PCE Plume and Intermountain Waste Oil Refinery. One CERCLIS potential Federal Superfund site, identified as the Bountiful 5-Points PCE Plume, is also within one mile of the project corridor. The other two CERCLIS sites identified within one mile of the project corridor were the previously mentioned NPL facilities (i.e., the Bountiful-Woods Cross 500 South PCE Plume and Intermountain Waste Oil Refinery).

The EPA's RCRA Enviro-Mapper database indicated that 67 RCRA hazardous waste regulated facilities are located within one mile of the project.

The DERR database and interactive map showed no Brownfields sites, nine Superfund sites, one NPL site, five Toxic Release Inventory (TRI) sites, 68 UST sites (19 of which are presently open), and 30 LUST sites (three of which are presently open) within one mile of the project corridor.

Cross checks between the various regulatory databases revealed additional details linking several of the separately listed sites identified above. Additionally, some mis-information shown in one database was corrected and corroborated by several sources familiar with the facility. Thus, further site descriptions and the ultimate potential for concern of each

site, as discussed in **Section 3.15.3**, is based on data derived from multiple database sources and discussions with EPA personnel (Robles, May 10, 2007 and May 17, 2007).

3.15.2 No Build Alternative

The No Build Alternative would not adversely impact the identified hazardous materials or waste sites. However, existing contamination would remain, unless cleaned up by others.

3.15.3 Build Alternative

Each of the sites identified in **Section 3.15.1** were evaluated to determine whether they were a potential concern for the project. The type of facility and the location of the hazardous material and/or waste in relation to the project were considered during this evaluation. There are 82 identified hazardous materials or hazardous waste sites of potential concern within a one mile radius of the project corridor. They are listed and summarized in **Table 3.15-1**. The approximate locations of these sites are shown in **Figure 3-13**. Sites with moderate or high potential for concern are further described in the paragraphs that follow this table. It is unlikely that a release from the remaining sites of low concern would adversely affect the project based on historic use, elevation, local soil type, groundwater flow direction, and the property's location relative to the project.

TABLE 3.15-1: HAZARDOUS MATERIALS OR WASTE SITES OF POTENTIAL CONCERN

Map ID	Facility ID #	Facility Name	Facility Location	Type	Potential Concern
1	UT0001119296 UTD981541600 UTD003807930	Bountiful-Woods Cross 500 South PCE Plume (aka Hatchco) (aka JB Kelley Inc) (aka Bountiful Family Cleaners)	500 South between 500 West and 950 West Woods Cross	Superfund – NPL TRI RCRA	High
2	84087PHLLP393SO 111-98	Holly Refining & Marketing Company (former Phillips 66 Co.)	500 South between 700 West and 800 West Woods Cross	TRI	High
3	UTD003807930	Woods Cross 800 West Plume (aka JB Kelley Inc) (aka Hatchco)	See Map ID #1	Superfund RCRA LUST UST	High
4	UTD981541600	Bountiful Family Cleaners	344 South 500 West Bountiful	RCRA UST	High
5	3000158	Woods Cross Commercial Park Phillips 66 (former RB's Interstate One Stop)	695 West 500 South Woods Cross	LUST UST	High

Map ID	Facility ID #	Facility Name	Facility Location	Type	Potential Concern
6	3000124	Sky Park	1800 South 1800 West Woods Cross	LUST UST	High
7	3000150	Car Wash (old Phillips # 007818)	325 South 500 West Bountiful	LUST UST	Moderate
8	3000246	Woods Cross City Shops	1490 South 1800 West Woods Cross	LUST UST	Moderate
9	UTD009102765	Caribou Four Corners Inc.	1431 South 1800 West Woods Cross	Superfund – NFA Brownfields RCRA	Moderate
10	3000175	Spreader Specialists	805 North Redwood Road North Salt Lake	LUST UST	Moderate
11	84087VLLYP727SO UTD980808505	Valley Paint Manufacturing	727 South 950 West Woods Cross	TRI RCRA	Low
12	UT0000748384	AC Texaco (former Sunmart # 945)	560 West 500 South Woods Cross	RCRA LUST UST	Low
13	3000010	Bailey's Moving & Storage	400 North 700 West Woods Cross	LUST UST	Low
14	84087CMPNN2415S	Companion Systems, Inc	2455 South Redwood Road Woods Cross	TRI	Low
15	UTD070534623	Golden Eagle Oil Refinery	1474 West 1500 South Woods Cross	Superfund RCRA	Low
16	UTR000005090	Herm Hughes & Sons, Inc	900 North Redwood Road North Salt Lake	RCRA	Low
17	84087CRWNS1710W UTD063305544	Cowboy Oil (aka Crown Asphalt) (aka Genesis Petroleum)	1710 West 2600 South Woods Cross	TRI RCRA LUST UST	Low
18	UT0000747600	Horizon Publishers & Distributing	50 South 500 West Woods Cross	RCRA UST	Low
19	UTD982580953	Cobb Diesel & Gear Repair (aka Rainbow Trucking)	1057 West 500 South West Bountiful	RCRA	Low
20	UTD988071064	Utah Auto Auction	1650 West 500 South Woods Cross	RCRA	Low
21	UTD988074928	Black Hills Trucking	945 North Redwood Road North Salt Lake	RCRA	Low
22	UTD988066775	BP Pipelines N America, Inc	Northwest corner of 500 South and Redwood Road Woods Cross	RCRA	Low
23	UTD097758254	Utah Wood Preserving	1959 South 1100 West Woods Cross	Superfund – NFA RCRA UST	Low
24	UT0008921894	Bountiful 5-Points PCE Plume (aka Your Valet of Utah)	1501 South Main Bountiful	Superfund RCRA	Low
25	UTD988066072	Singley Drums	157 South 500 West Bountiful	Superfund – NFA	Low

Map ID	Facility ID #	Facility Name	Facility Location	Type	Potential Concern
26	UTD982584112	Mineral Fertilizer	350 Redwood Road North Salt Lake	Superfund – NFA	Low
27	UTD045267127	Husky Oil Company	333 West Center Street North Salt Lake	Superfund – NFA	Low
28	UT0001277359	Intermountain Waste Oil Refinery	995 South 500 West Bountiful	Superfund – NPL RCRA VCP	Low
29	3000250	Bryson Sales & Service	567 West 25 South Bountiful	UST	Low
30	3000284	Triangle Tire	25 South 500 West Bountiful	UST	Low
31	3000348	David Early # 7	410 South 500 West Bountiful	UST	Low
32	3000448	Wash It Car Wash	320 West 500 South Bountiful	UST	Low
33	3000292	Black's Title	453 West 500 South Bountiful	UST	Low
34	3000396	Jakes' Glass Company	640 South 500 West Bountiful	UST	Low
35	3000472	Jackson's Food Store # 37	1109 West 500 South West Bountiful	UST	Low
36	3000393	Acklie Maintenance	695 West 1100 North North Salt Lake	UST	Low
37	3000109	M & P Development	1462 South 1500 West Woods Cross	UST	Low
38	3000446	Clem's Close Out Center	1881 South Redwood Road Woods Cross	UST	Low
39	3000275	Skypark Airport, Inc	1887 South 1800 West Woods Cross	UST	Low
40	3000295	Rainbo # 41	515 South 500 West Bountiful	LUST UST	Low
41	3000477	Lodder Automotive	560 South 500 West Bountiful	LUST UST	Low
42	3000117	Circle K # 7951	495 South 500 West Bountiful	LUST UST	Low
43	3000215	AAMCO Transmissions	107 South 500 West Bountiful	LUST UST	Low
44	3000456	Lund Automotive	1090 West 500 South West Bountiful	LUST UST	Low
45	3000044	Silver Eagle Refining	2355 South 1100 West Woods Cross	LUST UST	Low
46	UTD982590234	Jack B Parson Companies	1055 West 500 South West Bountiful	RCRA	Low
47	UTD988069209	Minit Lube # 1013	327 West 500 South Bountiful	RCRA	Low
48	UTD988078358	Marque Body & Paint	530 West 600 South Bountiful	RCRA UST	Low

Map ID	Facility ID #	Facility Name	Facility Location	Type	Potential Concern
49	UTD988070397	Firestone Tire & Rubber	530 South 500 West Bountiful	RCRA	Low
50	UTR000003327	Grandma's Tires	400 West 500 South Bountiful	RCRA	Low
51	UTD988072542	Ray's Muffler Service Trucking	792 South 500 West Bountiful	RCRA	Low
52	UTD988068979	The Cabinetry	753 South 1100 West Woods Cross	RCRA	Low
53	UTR000004762	Chapman Racing Heads, Inc	2290 South 1560 West Woods Cross	RCRA	Low
54	84087CHMCN2465S UTD000710723	Chemcentral	2465 South 1100 West Woods Cross	TRI RCRA VCP	Low
55	UTR000005330	Composite Coatings LLC	965 West 850 South Woods Cross	RCRA	Low
56	UTR000006569	Foreland Transportation	2561 South 1560 West Woods Cross	RCRA	Low
57	UT0000448332	Hawk Transportation	1017 West 750 South Woods Cross	RCRA	Low
58	84087CRYSN2355S UTD063314975	Inland Refining, Inc	2355 South 1100 West Woods Cross	TRI RCRA	Low
59	UTD981549496	KC Asphalt (aka Koch Asphalt) (aka Conoco)	991 West 1500 South Woods Cross	RCRA	Low
60	UTD044647022	Murdock Chevrolet, Inc	2375 South 625 West Woods Cross	RCRA UST	Low
61	UTD988074274	Phillip Plant Services (aka Allwaste)	2525 South 1100 West Woods Cross	RCRA	Low
62	UTR000004218	Quality Plating Co.	2087 West 2425 South Woods Cross	RCRA	Low
63	84054KCHMT95WES UTD113404446	KC Asphalt LLC	95 West 1100 North North Salt Lake	TRI RCRA	Low
64	UTD982591737	Advanced Metal Finishing	50 East 1100 North North Salt Lake	RCRA	Low
65	UTD086800620	Aero Technology	395 West 1100 North North Salt Lake	RCRA	Low
66	UT0001012897	CEC Environmental Services	640 North Main Street North Salt Lake	RCRA	Low
67	UTD988072534	Hodson Chemical Construction Corp.	955 North 400 West North Salt Lake	RCRA	Low
68	UTR000004861	RPS, Inc	720 North 400 West North Salt Lake	RCRA	Low
69	UTD980959472	Marion Willey & Son Ford	1800 South Main Street Bountiful	RCRA	Low
70	UTD009088899	Carr Printing Co Inc	580 West 100 North (PO Box 888) Bountiful	RCRA	Low

Map ID	Facility ID #	Facility Name	Facility Location	Type	Potential Concern
71	84054ZRNCL200NO UTD982590622	Zero Manufacturing Inc	500 West 200 North (PO Box 540310) North Salt Lake	TRI RCRA	Low
72	UTR000001495	Q Lube # 1012	180 North 500 West Bountiful	RCRA	Low
73	UTD988069944	Neil's Used Truck & Car Sales	695 West 1100 North North Salt Lake	RCRA	Low
74	UTD035347921	Albertson's Distribution Center	620 West 600 North North Salt Lake	RCRA	Low
75	UTD988072138	Chevron USA	391 North 500 West Bountiful	RCRA	Low
76	UTD988071783	5-Pts Laundrymat	1660 South Main Street Bountiful	RCRA	Low
77	UTD073104069	Pioneer Pipeline Co	245 East 1100 North North Salt Lake	RCRA	Low
78	UTR000005058	Redman Pipe & Supply	485 North 400 West North Salt Lake	RCRA	Low
79	UTR000000935	Dealers Choice	745 West 200 North North Salt Lake	RCRA	Low
80	UTR000006999	Hill Brothers Chemical Co	75 North 640 West North Salt Lake	RCRA	Low
81	84054FSHRC980NO	Fisher Co	980 North Main Street North Salt Lake	TRI	Low
82	3000323	Pipe Fabrication & Supply	2389 South 1100 West Woods Cross	LUST UST	Low

Sources: EPA, 2006a/2006b/2006c; DERR, 2006a/2006b

Low = Sufficient distance from construction activities and / or site has been identified as cleaned or closed.

Moderate = Partial property acquisition and excavation, earthwork, or demolition is required.

High = Full acquisition of known contamination within roadway section and excavation, earthwork, or demolition is required.

RCRA = Resource Conservation and Recovery Act; TRI = Toxic Release Inventory; LUST = Leaking Underground Storage Tank; UST = Underground Storage Tank; VCP = Voluntary Cleanup Program; NPL = National Priority List; NFA = No Further Action.

1 – 500 South PCE Plume: The Bountiful-Woods Cross 500 South PCE Plume is a Superfund site on the NPL and is also registered on the TRI system. Discovery investigations into this contamination plume began in 1995 and the plume has been determined to be roughly bounded by 750 South to 200 North and 500 West to 950 West in the cities of Bountiful, West Bountiful, and Woods Cross. PCE and TCE have been identified as the contaminants of concern for this plume. Two separate plumes have been identified to date as contributing sources. The Bountiful Family Cleaners (identified as Site #4) is believed to have been a source since 1967 or earlier. A second source was the former Hatchco property located near 700 South 800 West in West Bountiful. A portion of the Hatchco property was later sold to JB Kelley (identified in Site #3). The Build

Alternative would require ROW and construct within the limits of the 500 South PCE Plume(s). The findings of the site characterization done by the EPA indicate that there is a high potential to encounter contamination along 500 South between 500 West and 950 West. As such, this entire stretch of 500 South will be monitored during construction for PCE, TCE, and petroleum impacted soils. Therefore, the properties that are further summarized will focus on sites that pose an environmental threat separate from and beyond the characteristics of those described for this plume.

2 – Holly Refinery MTBE Plume: The MTBE Plume is suspected to have originated from the former Phillips 66 Company refinery. This plume has intermingled with the 500 South PCE Plume in the area of 500 South 800 West. The UDEQ is working with the present property owner, Holly Refining and Marketing, to remediate this plume which has migrated to the west by northwest across 500 South. The Build Alternative would construct along 500 South within the limits of the plume; therefore, a high potential for encountering contaminants exists. Since this site is situated within the 500 South PCE Plume area delineated by the EPA, monitoring of this site is included in Site 1.

3 – 800 West Plume: The 800 West Plume has been traced back to its likely point of origin at JB Kelley, Inc. (formerly part of the Hatchco property), located at 643 South 800 West in Woods Cross. The EPA has formally associated this plume with the 500 South PCE Plume, which is also included on the NPL, and on-line information regarding this plume was directed back to the 500 South PCE Plume web databases. The site is also registered on the LUST database. Incomplete UST information was available in the DERR database; however, used oil was identified as being in one of the LUSTs located on the property. The other UST(s) was not identified, nor were its contents. The Build Alternative would construct along 500 South just to the north of this property; however, a high potential for encountering contaminants still exists. Monitoring of this site is included in Site 1.

4 – Bountiful Family Cleaners: Potential concerns and monitoring associated with this site, located at 344 South 500 West in Bountiful, are discussed as part of Site 1.

5 – Woods Cross Commercial Park Phillips 66 (former RB's Interstate One Stop): Located at 695 West 500 South in Woods Cross, this facility was a filling station and convenience store with nine active USTs on site. According to the DERR, LUST database, in 1993 a UST containing gasoline failed a leak test and a release report was filed. This release is also noted as being eligible for Petroleum Storage Tank Trust Funds. No soil or water was noted to have been treated as a result of this release. Given the project will require a temporary easement for construction and a permanent easement following construction from the northern edge of this property, a high potential for encountering

contaminants exists. Additionally, since this site is situated within the 500 South PCE Plume area delineated by the EPA, monitoring of this site is included in Site 1.

6 – Sky Park: Located at 1800 South 1800 West in Woods Cross, this property is listed on the DERR UST and LUST lists. Two jet fuel USTs were located on site, and in 1989 a release of jet fuel was reported to the Utah DERR. No soil or water was noted as having been treated following this release and the Utah DERR closed their file for this tank in 1990. Given the project will require a temporary easement for construction and a permanent easement following construction from the eastern edge of this property, a high potential for encountering contaminants exists. As such, this site will be monitored for petroleum-impacted soils during construction.

7 – Car Wash (former Phillips #007818): This property located at 325 South 500 West in Bountiful, is listed on the UST and LUST databases. The LUST database indicates a release was discovered and reported in 2002. No soil or water was noted to have been treated following the spill report and the file was closed later that year. Given the location of this property relative to the project corridor and local groundwater flow direction, a moderate potential for encountering contaminants exists at the eastern-most end of the project corridor. Monitoring already being conducted for the 500 South PCE Plume during construction would identify petroleum-impacted soils associated with this site as well.

8 – Woods Cross City Shops: Located at 1490 South 1800 West in Woods Cross, this property is listed on the DERR UST and LUST lists. One gasoline UST was located on site, and in 1991 a release of gasoline was reported to the Utah DERR following removal of the tank from the ground. No soil or water was noted as having been treated following this release and the Utah DERR closed their file for this tank in 1995. Given the project will require a temporary easement for construction and a permanent easement following construction from the eastern edge of this property, a moderate potential for encountering contaminants exists. This site will be monitored for petroleum-impacted soils during construction.

9 – Caribou Four Corners Inc.: Located at 1431 South 1800 West in Woods Cross, this property is on the Superfund and RCRA databases. The EPA Superfund database indicates this property has a No Further Action (NFA) status. The RCRA database indicates this property was last updated in 1980 and has an Unspecified Universe classification. No further information is available regarding this property on the databases searched. Given the project will require a temporary easement for construction and a permanent easement following construction from the western edge of this property, a

moderate potential for encountering contaminants exists. This site will be monitored for petroleum-impacted soils during construction.

10 – Spreader Specialists: Located at 805 North Redwood Road, North Salt Lake, this property is on the UST and LUST databases. A release was filed with the Utah DERR in June, 2006. No further information was available in the database regarding the nature of the release. Although the site is beyond the southern project limits, a moderate potential for encountering contaminants exists. Construction in the vicinity of the Redwood Road and 2600 South intersection will be monitored for petroleum-impacted soils during construction.

3.15.4 Other Potential to Encounter Hazardous Materials or Waste

Soil excavation would occur in areas near former and existing pump islands. Several organic compounds associated with gasoline are known or suspected carcinogens (e.g., benzene, toluene, ethyl benzene, xylenes). At high concentrations, many of these constituents are also acutely toxic causing respiratory distress, nausea, etc.

In addition to these volatile organic compounds, another toxic constituent commonly associated with gasoline contamination is lead. According to the EPA, lead causes a variety of effects at low dose levels (EPA, 1999). Brain damage, kidney damage, and gastrointestinal distress are seen from acute (short-term) exposure to high levels of lead in humans. Chronic (long-term) exposure to lead in humans results in effects on the blood, central nervous system, blood pressure, kidneys, and Vitamin D metabolism. Children are particularly sensitive to the chronic effects of lead, with slowed cognitive development, reduced growth, and other effects reported. Reproductive effects, such as decreased sperm count in men and spontaneous abortions in women, have been associated with high lead exposure. The developing fetus is at particular risk from maternal lead exposure, with low birth weight and slowed postnatal neurobehavioral development noted. Human studies are inconclusive regarding lead exposure and cancer. Depending upon concentration and exposure route (e.g., inhalation, ingestion, direct contact) constituents of gasoline can have either acute and/or chronic effects on human health.

Similarly, gasoline constituents can affect ecological receptors, particularly when contaminants migrate into a waterbody. Effects on wildlife include low growth rates in plants; developmental, reproductive, and nervous system problems in mammals, birds, and fish; and, in severe cases, death (Environment, Health and Safety Online, 2004). Lead is highly toxic to aquatic life, particularly in soft water. Since lead bioaccumulates in the tissues of living organisms, it can result in secondary toxicity in animals and humans at

the top levels of the food chain. In addition to threatening human health and the environment, acquiring contaminated property also presents future risks to UDOT as the new property owner.

In addition to the regulated UST facilities identified through the database search, USTs used for heating oil storage could be associated with structures that are located along the highway. Any such USTs represent potential sources of environmental contamination and future UDOT liabilities. Contaminated sites can pose a threat to human health and/or ecological receptors exposed to contaminated environmental media. Clean up of contaminated environmental media is costly and can take several years to complete in some cases.

3.15.5 Construction Related Impacts

The project would construct on land associated with the following sites of potential concern: Bountiful-Woods Cross 500 South PCE Plume (aka Woods Cross 800 West Plume that encompasses Hatchco, and Bountiful Cleaners, as well as all remaining unspecified properties on 500 South between 500 West and 950 West), Holly Refining & Marketing, Woods Cross Commercial Park Phillips 66 (former RB's Interstate One Stop), Sky Park, Woods Cross City Shops, and Caribou Four Corners Inc. Construction may also uncover contaminants that have migrated into the ROW from nearby hazardous waste generators. Contaminants migrating to the ROW from source areas outside the ROW are the responsibility of the source area owner. Upon discovery of contamination, the DERR would be contacted immediately.

Uncovering or disturbing contaminated media during construction could cause the volatilization of organic compounds associated with petroleum products, which can cause adverse health effects to workers exposed to the compounds as discussed. In addition, asbestos-containing materials (ACMs) must be removed according to all applicable federal, state, and local regulations prior to demolition activities.

Construction and demolition activities could affect properties with ACMs. Building construction materials containing asbestos are found in a variety of types and uses. Common types of ACMs used in building construction include vinyl floor tile, linoleum flooring, mastic, ceiling tile, spray-applied acoustical/decorative ceiling materials and fireproofing, plaster, wallboard and wallboard joint compound, pipe and boiler insulation, roofing and flashing, and many other materials in common use prior to 1978. ACMs may also be present in debris piles containing discarded building construction materials. Certain asbestos-containing building construction materials such as roofing, roofing tar, and adhesives were still commonly used after 1978. In addition to ACMs,

many buildings constructed prior to 1978 were painted with lead-based paint. Because of the construction date of the buildings along the corridor, the presence of lead-based paint cannot be precluded.

3.15.6 Mitigation Measures for Hazardous Materials or Waste

Specific mitigation plans will be developed and implemented to contain hazardous materials encountered during construction and to minimize remaining contamination following construction. If warranted, further mitigation will be developed following additional investigation of those sites. UDOT Specification 08A2-3 includes provisions in the event that additional hazardous waste sites are discovered during construction. Should workers encounter contamination during construction in these or any other locations, they should clear the area and contact the DERR immediately. Other mitigation measures include the following:

- The contractor will be required to provide written notification to the DAQ at least 10 working days before the demolition of any structure, including buildings with no asbestos. DAQ indicates that Regulated Asbestos-Containing Materials (RACM), which include friable ACMs and previously non-friable ACMs that may become friable as a result of demolition activities, must be identified by a certified asbestos inspector and removed by a certified asbestos abatement contractor prior to demolition. If the amount of asbestos to be removed is greater than the National Emission Standard for Hazardous Air Pollutants (NESHAP) size, then notification and payment of the appropriate fee is due 10 working days prior to the asbestos removal project. The NESHAP size is defined as 260 linear feet of asbestos from pipes, 160 square feet, or 35 cubic feet from other facility components. Written notification is due at least one working day before the less-than-NESHAP-size amount of RACM is disturbed on any renovation project. No fee is charged for less-than-NESHAP-size renovation projects.
- During demolition activities, the contractor will ensure that workers follow Occupational Safety and Health Administration (OSHA) regulations regarding potential exposure to airborne lead and asbestos. In addition, representative samples of any construction waste derived from commercial structures should be tested by the Toxic Characteristic Leaching Procedure (TCLP) to determine if the waste is hazardous. According to the EPA, construction debris derived from residential structures constructed prior to 1978 is exempt from lead characterization requirements. However, individual landfills often require lead characterization (TCLP analysis) prior to acceptance of construction debris

derived from residential structures constructed prior to 1978. Pre-demolition coordination with the landfill responsible for accepting the demolition wastes derived from this project is recommended.

- The contractor will properly remove and dispose of asbestos and lead contaminated materials according to all federal, state, and local regulations. The contractor will also be advised of the potential of encountering petroleum hydrocarbon contamination.
- The contractor will monitor and properly handle and dispose of PCE, TCE, petroleum or other contaminant-impacted soils during construction. At a minimum, the following sites require monitoring:
    - 1 – 500 South PCE Plume site, inclusive of any property along 500 South between 500 West and 950 West;
    - 6 – Sky Park, 1800 South 1800 West;
    - 7 – Car Wash, 325 South 500 West;
    - 8 – Woods Cross City Shops, 1490 South 1800 West;
    - 9 – Caribou Four Corners Inc., 1431 South 1800 West; and
    - 10 – Spreader Specialists, 805 North Redwood Road.
- Should full property acquisition or the disposal of surplus property from the following sites be necessary, the UDOT Environmental Division will be consulted to determine the extent of further investigation applicable to each site. When permission to conduct this investigation can be obtained from the existing property owner, UDOT should conduct this investigation prior to acquisition of the property:
    - 1 – 500 South PCE Plume site, including any property along 500 South between 500 West and 950 West;
    - 6 – Sky Park, 1800 South 1800 West;
    - 8 – Woods Cross City Shops, 1490 South 1800 West;
    - 9 – Caribou Four Corners Inc., 1431 South 1800 West;
    - 12 – AC Texaco (former Sunmart #945), 560 West 500 South;
    - 14 – Companion Systems, Inc., 2455 South Redwood Road;

- 16 – Herm Hughes & Sons, Inc., 900 North Redwood Road;
- 19 – Cobb Diesel & Gear Repair, 1057 West 500 South;
- 20 – Utah Auto Auction, 1650 West 500 South;
- 21 – Black Hills Trucking, 945 North Redwood Road;
- 22 – BP Pipelines N America, Inc., Northwest corner of 500 South and Redwood Road;
- 26 – Mineral Fertilizer, 350 Redwood Road;
- 38 – Clem's Close Out Center, 1881 South Redwood Road; and
- 39 – Skypark Airport, Inc., 1887 South 1800 West.

3.16 VISUAL QUALITY

3.16.1 Visual Setting

Photos representing the visual setting are included in **Figure 3-14**. The visual experience in the project corridor is characterized by the diversity provided by four landscape components:

- **Landform:** Flat sub basin associated with the ancient Lake Bonneville. Mountain ranges are visible in the distance.
- **Water:** A1 and A1-A drains, Mill Creek and associated stilling basin.
- **Vegetation:** Agricultural fields, landscaping associated with development.
- **Man-Made Development:** Residential areas, industrial areas, commercial areas, historic sites, roadways, utility lines, bridges, billboards/signs.

Visual impacts can occur when there is a detrimental effect on the perceived beauty of a place or structure.

3.16.2 No Build Alternative

The No Build Alternative would not alter views of or from SR-68. Development and redevelopment along SR-68 would continue to occur. The visual quality of these developments would be guided by local plans.

3.16.3 Build Alternative

The visual impacts of the Build Alternative are not expected to change the overall character of the setting since the project includes widening an existing roadway in suburban area views dominated by surrounding industrial uses. Views from the facility are not anticipated to be dramatically altered. Alterations to visual views include widening of the roadway section, aesthetic treatments in median and/or shoulder areas, minor cut/fill slopes, and stormwater features. Temporary construction activities would also be visually unappealing for roadway users and residents. Street lights would be designed to minimize light pollution. The Build Alternative would provide more opportunities than the No Build Alternative for coordination with local government to develop visually appealing and distinct gateway features.

3.16.4 Mitigation Measures for Visual Quality

UDOT's Context Sensitive Solution (CSS) principles have been examined. Measures that have been incorporated into the Build Alternative to reduce visual impact include: meandering the alignment, matching the existing grade as much as possible, and providing consistency with roadway design elements. UDOT will continue to coordinate with local entities during final design and construction. Design preferences, such as aesthetic treatments within the median and shoulder areas, will be considered and incorporated to a reasonable extent (e.g., those that do not compromise safety). Additional local funding may be required to implement design preferences that are considered betterments.

3.17 SECONDARY IMPACTS

Since this project is in an existing urban area and does not change land use (see **Section 3.1**), secondary or indirect impacts as a result of the project are generally limited. As relevant, these types of impacts are discussed within the impact section for the applicable resource. For example, indirect wildlife impacts may be experienced because of the loss of wetlands. The inter-relationship between these two resources is discussed in **Sections 3.10** and **3.11**. The value of the wetlands recognizes that it provides wildlife habitat, and wetland mitigation is based on the function and value of the wetland lost.

3.18 CUMULATIVE EFFECTS

Cumulative impacts can result from individually minor but collectively substantial actions taking place over a period of time. As such, this section addresses the cumulative impacts on resources at risk that may result from the incremental impact of this project

when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions.

3.18.1 Scoping, Geographic, and Temporal Boundaries

In accordance with the Council on Environmental Quality (CEQ) guidance, the NEPA scoping process was the first step in identifying resources of concern that should be included in the cumulative impact analysis. Scoping identified important local issues that the project needs to consider (e.g., access management, aesthetic design features, and multi-modal access) and also stressed coordination with other major projects such as the Legacy Parkway and Commuter Rail to ensure compatibility with these projects. Scoping did not identify specific natural, cultural, or socioeconomic resources of concern that should be included in the cumulative impact analysis. As such, this analysis will briefly identify incremental increases resulting from the SR-68 project and compare these to impacts resulting from other major actions.

This project is located within Davis County and the incorporated limits of the cities of Woods Cross and West Bountiful. The geographic extent of potential cumulative impacts was based on scoping, traffic influence, the potential for direct and indirect impacts, and available data on other major actions. In general, baseline conditions were assessed at the county level, but where meaningful where extended to a broader level (i.e. Jordan and Lower Weber Watersheds) or narrowed to a municipal level (i.e. Woods Cross City).

The temporal boundaries range from the 1970s to 2030. The 1970s were selected for historic reference because it reflected the beginning of the conversion of Woods Cross (and most of Davis County) from rural community to a bed-room community with industrial development. According to the Woods Cross City General Plan, "After experiencing relatively slow growth since its incorporation in 1935, the pace of growth in Woods Cross has accelerated over the past two decades." (Woods Cross, 2003). Additionally, data on demographics and natural resources as well as aerial photography is readily available from the 1970s on. Baseline conditions reflect 2000-2006 depending on the available data and consistent with the travel demand analysis, 2030 was selected as the future horizon.

3.18.2 Baseline Conditions and Other Actions

Baseline conditions as well as direct and indirect project impacts have been presented for each resource in the preceding sections. Key past and present actions include the development of I-15 and the conversion of agricultural land to residential, commercial, and industrial development. **Figures 3-15** and **3-16** best illustrate land use changes over

the past three decades. This comparison of the aerial photographs from 1977 and 2004 shows a dramatic change in land use in Woods Cross and North Salt Lake. The conversion of agricultural lands and farmsteads to residential and industrial uses is the dominant land use trend. This land use conversion is consistent with the population growth trends discussed in **Section 3.3.1.1**.

In 1977, the project vicinity was already influenced by I-15, oil refineries, the Skypark Airport, and the facilities and services in West Bountiful. Within Woods Cross, residential development was concentrated in the Old Town neighborhood and along 1100 West.

This on-going trend of the conversion of agricultural lands has gradually altered the natural, cultural, and socioeconomic setting of the area similar to other communities along the Wasatch Front. Based on Davis County building permits issued since 1999, about 700 acres of land are being developed per year in Davis County (UDOT, 2005a). This development trend is anticipated to continue and will include major developments such as Valentine Estates, Mountain View Estates, Foxboro, and a TOD near the planned Woods Cross Commuter Rail station. Currently, Woods Cross, West Bountiful, and North Salt Lake are characterized as bedroom communities with land uses developed at a suburban density. Additional reasonably foreseeable actions include:

- I-15 reconstruction from 600 South in Salt Lake City to 200 North in Kaysville;
- Legacy Parkway and Nature Preserve; and
- Commuter Rail.

3.18.3 Potential Cumulative Impacts

The focus of the potential cumulative impacts analysis is based on a review of past trends and the incremental increase of the impacts attributed to the SR-68 project when compared to other reasonably foreseeable actions. Available information relevant to the resources with potential for cumulative impacts from the SR-68 project and other reasonably foreseeable transportation projects have been summarized in **Table 3.18-1** and discussed in the paragraphs following this table. The Legacy Parkway impacts are fully documented in the November 2005 FSEIS (UDOT, 2005a) and the Commuter Rail Project is documented in the March 2005 FEIS (UTA, 2005). Impacts for the I-15 North Corridor Project were approximated using data collected by UDOT for an EIS that is not yet approved (UDOT, 2000).

TABLE 3.18-1: CUMULATIVE IMPACT SUMMARY

Resource	SR-68	Legacy Parkway	Commuter Rail	I-15	Total Impacts	Attributed to SR-68
Location of Impacts	Davis County	Salt Lake and Davis Counties	Salt Lake, Davis, and Weber Counties	Salt Lake and Davis Counties		
Residential Displacements	9	4	2	11	26	35%
Business Displacements	5	14	4	12	35	14%
Wetlands	0.06 acres	113 acres	19.3 acres	12.28 acres	145 acres	<1%
Historic Architectural Properties – Adverse Effect	1	2	10	0	13	8%

Notes: Total impacts represent the rounded incremental impact of reasonable foreseeable transportation projects. Total cumulative impacts also include the impact of other development. The impact of other commercial and residential development has not been quantified to the same level of detail, but is considered and evaluated in the following sections as part of the cumulative impact assessment.

Source: UDOT, 2005a; UTA, 2005; UDOT, 2000

3.18.3.1 Land Use

Historic and projected land use trends include the continued conversion of agricultural land to developed land. During interviews for the Legacy Parkway project, local jurisdictions stated that the projected level of development in Davis and Weber Counties is expected to be the same regardless of the transportation project, but acknowledged that the projects could locally affect the location, density, and type of development. Roadway improvements such as Legacy Parkway and I-15 would have more effect on land use at interchange locations, such as 500 South, while Commuter Rail would have more effect on land use at station locations, such as the Woods Cross Station, where TOD would be encouraged.

Planned residential, commercial, and industrial development will continue independent of these transportation projects; however, the Legacy Nature Preserve would conserve 2,098 acres of undeveloped land for wetland and wildlife habitat. As explained in **Section 3.1.4**, secondary land use effects such as induced growth or altered development patterns are not anticipated as a result of the SR-68 project. The incremental change in cumulative impacts as a result of the SR-68 project on land use is minimal.

3.18.3.2 Social and Economic Resources

Land use changes in the vicinity of interchanges and Commuter Rail stations may provide social and economic benefits in the form of new jobs and tax revenues, new services, and new housing. Development would be under the jurisdiction of local governments and subject to zoning and land use regulation. From a cumulative standpoint, it is not anticipated that these land use changes would dramatically alter the social and economic setting of Davis County.

All populations, including minority and low-income, would benefit from improved regional vehicular, bicycle, and pedestrian mobility. The Build Alternative would further improve vehicular, bicycle, and pedestrian connections to major transportation facilities including the Legacy Parkway, Commuter Rail, and I-15. The potential for cumulative social and economic impacts resulting from project displacements are minimized due to adequate relocation options and new development. Additionally, project displacements are not concentrated within specific neighborhoods, so neighborhood level community cohesion and stability are not affected.

3.18.3.3 Wetlands

The loss of wetlands has been an ongoing process that began during the settlement of the valley and continues today. The Legacy Parkway FSEIS estimated that authorized wetland fill in Salt Lake and Davis Counties averaged 30 acres per year between 1992 and 2003. Other major transportation actions fill over 145 acres of wetlands in Salt Lake, Davis, and Weber Counties. All projects are subject to USACE regulations and the permitting process will stipulate measures to mitigate wetland impacts. The Legacy Parkway FSEIS found that cumulative wetland impacts were substantial both because of the timing of the impact and the magnitude of the impact and thus the project has developed substantial wetland mitigation including the 2,098 acre Legacy Nature Preserve. The preserve includes over 778 acres of wetlands and protects large tracts of wetland complexes adjacent to the Great Salt Lake that are at risk of being lost or impaired by future development. The Legacy Parkway and Nature Preserve has also mitigated for the cumulative effects of other North Corridor projects, including the SR-68 project.

3.18.3.4 Cultural Resources

Past projects, future transportation projects, and current and planned development have affected and will continue to affect cultural resources. Privately held historic architectural properties are subject to alteration and demolition upon the discretion and interests of

property owners. Local trends include the demolition and alteration of historic structures and subdivision of historic farmsteads. For example, a farmstead associated with Daniel Wood previously encompassed an area from 500 South to 400 North and from 1100 West to I-15, but over time the family has sold off portions, developed portions (e.g., Woodhaven MHP), and portions have been acquired by other major projects (e.g., I-15).

While the actions of private property owners are not restricted, the transportation projects are subject to requirements of Section 106 of the National Historic Preservation Act and Section 4(f) of the U.S. Department of Transportation Act and require extensive coordination with SHPO to minimize impacts to cultural resources. The SR-68 project, in conjunction with other reasonable actions both public and private, does contribute to the continued loss of resources in Davis County.

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